3

ANNALS OF LIBRARY SCIENCE

CUK-H02491-8-0208887
020.5
An72

Volume 3

1956

CALCUTTA UNIVERSITY
CENTRAL LIBRARY

INDIAN NATIONAL
SCIENTIFIC DOCUMENTATION CENTRE

EDITORIAL COMMITTEE

Dr. S.R. Ranganathan	Editor
S. Parthasarathy	Joint Editor

★

Published by

INSDOC
National Physical Laboratory
New Delhi 12, India

ANNALS OF LIBRARY SCIENCE

VOLUME 3 1956

CONTENTS

		Pages
1.	RANGANATHAN (S.R.). Depth classification. 17. Efficiency table	1-8
2.	KRISHNA RAO (D.B.). Depth classification. 18. Propagation in agriculture	9-10
3.	RANGANATHAN (S.R.). Open access in library. 1. Social functions of library	11-15
4.	GELDERBLOM (G.). Development of public libraries in the German Federal Republic	16-21
5.	RANGANATHAN (S.R.). Documentation in many lands. 4. Documentation: Conventional and non-conventional	22-32
6.	RANGANATHAN (S.R.). Depth classification. 19. Classification of management	33-85
7.	ARMSTRONG (M.). A method for recording loans in special libraries	86-90
8.	DAS GUPTA (S.). American libraries - some impressions	91-104
9.	LANGRIDGE (D.W.). Depth classification. 20. Some problems of a management classification	105-108
10.	RANGANATHAN (S.R.). Depth classification. 21. Phase and intra-facet relations	109-116
11.	PHADNIS (S.P.) and PATHAK (H.). Depth classification. 22. Field of knowledge in relation to textiles	117-120
12.	RANGANATHAN (S.R.). Open access in library. 2. Definition, scope and humanistic value	121-133
13.	NEELAMEGHAN (A.). Citation of periodicals	133-136

INDEX

AMERICAN libraries 91-104

ARMSTRONG (M.). A method for recording loans in special libraries 86-90

CITATION of periodicals 133-136

CLASSIFICATION of management 33-85, 105-108

DAS GUPTA (S.). American libraries 91-104

DEPTH classification
  17. Efficiency table 1-8
  18. Propagation in agriculture 9-10
  19. Classification of management 33-85
  20. Some problems of a management classification 105-108
  21. Phase and intra-facet relations 109-116
  22. Field of knowledge in relation to textiles 117-120

DEVELOPMENT of public libraries in German Federal Republic 16-21

DOCUMENT: conventional and non-conventional 22-32

DOCUMENTATION in many lands 22-32

EFFICIENCY table 1-8

FIELD of knowledge in relation to textiles 117-120

GELDERBLOM (G.). Development of public libraries in the German Federal Republic 16-21

GERMAN libraries 16-21

INTRA-FACET relations 109-116

KRISHNA RAO (D.B.).
  Depth classification 9-10
  Propagation in agriculture 9-10

LANGRIDGE (D.W.).
  Depth classification 105-108
  Some problems of a management classification 105-108

LOAN record 86-90

MANAGEMENT classification 33-85, 105-108

METHOD of recording loans in special libraries 86-90

NEELAMEGHAN (A.). Citation of periodicals 133-136

OPEN access in library 11-15, 121-133

PATHAK (H.).
  Depth classification 117-120
  Field of knowledge in relation to textiles 117-120

PERIODICALS citation 133-136

PHADNIS (S.P.)
  Depth classification 117-120
  Field of knowledge in relation to textiles 117-120

PHASE and intra-facet relations 109-116

PROPAGATION in agriculture 9-10

RANGANATHAN (S.R.)
  Classification of management 33-85
  Depth classification 1-8, 33-85, 109-116
  Document: conventional and non-conventional 22-32
  Documentation in many lands 22-32
  Efficiency table 1-8
  Open access in library 11-15, 121-133
  Phase and intra-facet relations 109-116

TEXTILES, field of knowledge 117-120

2C 3557

CALCUTTA UNIVERSITY CENTRAL LIBRARY

DEPTH CLASSIFICATION *

17 EFFICIENCY TABLE

S. R. RANGANATHAN

Demonstrates the application of Efficiency Table to show at a glance the unused potentiality of a scheme of classification. By its use, notational plane stimulates work in the idea plane.

1 INTRODUCTION

In a scheme of classification with mixed notation, octaves arise in each zone; zones are formed in each array; arrays may be formed in each facet; and facets may occur in each phase. Arrays may be formed in a basic class also. The ideal should be to use every octave in every zone, of every array, of every facet, in every phase. If every ocatve of every zone in every array of every facet in the first phase is used, potentially the same will happen in the second and in the later phases. Therefore, it is sufficient to study the first phase only.

11 Implication of Efficiency

One of the functions of the classificationist is to establish one-one correspondence between the isolate ideas in the idea plane and the isolate numbers in the notational plane. In this discussion, basic ideas and basic numbers also should be examined in relation to one one correspondence. Virtually, therefore, whatever is said of isolate applies also to basics. It often happens that an isolate idea is without an obvious isolate number corresponding to it. Then a suitable isolate number, otherwise running to waste, has to be made to represent it. It also happens that a possible isolate number is without an isolate idea to correspond to it. Then a search has to be made in the idea plane It often happens that an isolate idea, capable of being represented by that isolate number, had been originally overlooked because of the difficulty in finding an isolate number to represent it. It may even be that the isolate idea concerned did not suggest itself originally. Efficiency in the design of the classification depends on these two factors intrinsic to one-one correspondence.

12 Efficiency Table

In the study of facet analysis a tabular method was used to get a measure of the Versatility of a scheme of classification. This was in Ranganathan's Optional facets (9) published in the Annals part of the Abgila, 2, 1952, 173-200. Vickery has called this table a versatility Table. His letter containing observations on Ranganathan's Report 5 to FID/CA (published as document F55-37 dated 24 May 1955) has suggested the application of a similar tabular method to study the efficiency of a scheme of classification. When put to this use, the table may be called an Efficiency Table.

---

* Continued from *An lib sc* 2, 1955, 111.

13 Guinea-Pig

In the demonstration of the use of efficiency table, it will be more comfortable to use a particular scheme of notation than a generalised one - say with *m* species of substantive digits, *n* octavising digits, and *p* connecting symbols, used along with *q* fundamental catagories, each with different rounds and levels. It happens that CC is at present the only scheme that starts with definite postulates on all these matters. CC is therefore used as the guinea-pig in this demonstration. But this does not take away from the generality of the use of efficiency table.

14 Postulates of CC

The postulates of CC, relevant to this demonstration may be stated here for ready reference.

141 Idea Plane

The following are the relevant postulates in the idea plane:-

1411 The fundamental catagories, of one and only one of which each isolate idea is a manifestation, are postulated to be five in number *viz*. Time, Space, Energy, Matter, and Personality.

1412 Levels of manifestation of Time, Space, Matter and Personality are postulated.

1413 Rounds of manifestation of Energy, Matter and Personality, are postulated.

1414 Anteriorising Common Isolates, bypassing the concept of fundamental categories, are postulated.

142 Notational Plane

The following are the relevant postulates in the notational plane:-

1421 The species of substantive digits are postulated to be three in number, *viz*. Small Romans, Indo-arabic Numerals, and Capital Romans.

1422 Octavising digits can be postulated to be three in.number, *viz*. *z*, 9, and Z. Actually 9 alone has been used till now as an octavising number.

1423 Packeted Numbers, got by enclosing class number within circular brackets, are postulated to be a fourth species of substantive digits. Each packeted number has the status of a single digit. It may be got by subject device, or quasi subject device, or enumeration.

1424 The connecting symbols postulated and relevant to this discussion are four in number, *viz*. the punctuation marks of Full Stop, Colon, Semi-colon and Comma.

15 Row Heading

In practice we shall have normally six rows in an efficiency table of CC. The headings of the rows will be respectively: Zone 1; Zone 2; Octave 1; Zone 2; Octave 2; Zone 3; Penultimate Octave; Zone 3; Last Octave; and Zone 4. The following table gives the notational features of the regions of an array denoted by these headings of rows:-

Notes

151 Significant Digit = Substantive Digit not used as octavising digit.

152 Quasi Isolate = Characteristic used as isolate

153 When the number of (SI) (E) exceeds eight, the excess will occupy (22), (23) etc. to the extent necessary; and (SQI) (E) will occupy the earliest octave not occupied by (SI) (E) and the later ones to the extent necessary.

154 When there is no (SI) (E), (SQI) (E) will occupy (21) and the later octaves to the extent necessary.

155 In some arrays, (SI) (CD) and (SI)(AD) may exchange their octaves.

Ser. No.	Name of regions used as Row Heading			Peculiarity in Notational Plane		Normal use in a facet		
	Zone	Octave	In symbol	No. of initial 9's	First significant digit	Nature of isolate	Device used	In symbols
1	1	1	(11)	0	Roman small	Common Isolate	Enumeration	(CI)(E)
2	2	1	(21)	0	Arabic Numeral	Special Isolate	Enumeration	(SI)(E)
3	2	2	(22)	1	Arabic Numeral	Special Quasi-Isolate	Enumeration	(SQI)(E)
4	3	Penultimate	(32)	1	Roman Capital	Special Isolate	Chronological Device	(SI)(CD)
5	3	Last	(31)	0	Roman Capital	Special Isolate	Alphabetical Device	(SI)(AD)
6	4	1	(41)	0	Bracket	Common Isolate	Packet Notation with Subject Device or	(CI)(PSD)
							Quasi-Subject Device or	(CI)(PQSD)
							Enumeration	(CI)(PE)

16 Column Heading

The heading of a column in efficiency table will consist of a specification of "basic class" and the name of the order of the array, or the name of round, level and fundamental category of a facet and the number of the order of an array. The number of columns will depend upon the coverage of the efficiency table constructed.

161 Symbols for Headings

For brevity, symbols such as the following will be used in the column headings:-

(A1) = Array of order 1
(An) = Array of order n
(BC) = Basic class
[1P1] = Personality facet of round 1, level 1
[mPn] = Personality facet of round m, level n

[1M1] = Matter facet of round 1, level 1
[mMn] = Matter of facet of round m, level n
[1E] = Energy facet of round 1
[mE] = Energy facet of round m
[S1] = Space facet of level 1
[Sn] = Space facet of level n
[T1] = Time facet of level 1
[Tn] = Time facet of level n

17 Cell in Efficiency Table

Cell = The square formed at the intersection of a row and a column in an efficiency table.

A cell will be denoted by a symbol-pair included within crooked brackets. The first symbol will be the one denoting the row generating the cell; and the second symbol will be the one denoting the column generating it. For example, {(21), [1P1](A1)} = Cell at the intersection of the row headed "Zone 2 Octave 1" and the column headed "Personality facet of round 1, level 1, Array of order 1".

171 Occupant of Cell

Each cell in an efficiency table is occupied by a symbol, according to the following scheme:

Occupant of cell	Significance
0	Cell not available for use. It is a pseudo-cell.
?	Cell available for use. But it has not yet been brought to use. It is a fallow cell.
Any other Symbol	Cell already brought to use. It is a used cell. The nature of the use is indicated by the symbol. The meaning of the symbol is given in table in section 15.

172 Additional Symbols

The following additional symbols occur among the cells:-

(ACI) = Anteriorising common isolate. It bypasses the fundamental categories.

(PCI) = Posteriorising common isolate. Each fundamental category has its own distinctive schedule of posteriorising common isolates.

(MC) = Main class.

(CS) = Canonical subdivision.

18 Conspectus

A single efficiency table covering all the possible column headings that is, arrays of every order, in every facet, in every level, in every round, and of every fundamental category will be too unwieldy for use in practice. Therefore we shall break it into small tables, that is tables with a smaller number of columns. We may even have to consider a table with only one column. It is of help to have one efficiency table for arrays of order 1 — of basic class, and of the facets of round 1 level 1 of each fundamental category. It is of help to have also another efficiency table for arrays of order 2 of these categories. It is found necessary to have another efficiency table for arrays of order 2 of the main classes "M Useful Arts" and "N Fine Arts". For, these have special features. Our experience with higher rounds and levels is now too meagre to warrant any generalised study of efficiency tables with facets belonging to them. Only a few remarks may be possible in particular cases. This is due to documentation work still feeling too shy to use Depth Classification involving higher rounds and levels. This shyness will have soon to be shed if the profession of documentation is to play its part efficiently and adequately in the progress of world-wide team-research now made necessary by the disturbance in the balance between the population pressure and the near-natural commodities. Part of this shyness is no doubt due to the stale-mate caused in classification by seeking to meet most of the new developments in the universe of knowledge by the addition of new arrays only. But the implementation of the life-giving concepts of fundamental categories, rounds, levels, zones, and octaves will clear the way for progress.

2 Efficiency Table for Array of Order 1

	(BC)	[1P1]	[1M1]	[1E]	[S1]	[T1]
(11)	Generalia(E)	(ACI)(E)	(PCI)(QSD)	(PCI)(E)	0	Private time & seasons(E)
(21)	Recently recognised (MC) (E) Bypassing traditional (MC)	(SI)(E)	(SI)(E)	(SI)(E)	Land formations (E)	0
(22)	?	(SQI)(E)	(SQI)(E)	(SI)(E)	Ocean formations (E)	0
(32)	?	Specials(E)	?	(SI)(E)	?	0
(31)	Traditional (MC)(E)	Systems(CD)	(SI)(AD)	(SI)(AD)	0	Public time (E)
(41)	Newly emerging methodologies (MC)(PQSD)	?	(CI)(PE)	(SI)(PSD)	?	?

NOTES

211 In Zone 1 of (BC), arrays of order 1 and 2 stand telescoped, as viewed from the idea plane. z alone belongs to array of order 1 in the idea plane. a, b, c etc. really stand for za, zb, zc etc. They thus belong to array of second order in the idea plane. However, by a special rule, the initial z is omitted and taken as understood, with the result that in the notational plane the class numbers apppear to belong to array of order 1. The telescoping is the result of this illusion.

212 The anterior common isolates are the same for each of the fundamental categories of Personality, Matter and Energy.

213 Each of these three fundamental categories has its own different schedule of posteriorising common isolates.

214 The notational exigency of CC denies posteriorising common isolates in the array of order 1 of the personality facet of level 1. This exigency is created by the special rule that the connecting symbol need not be inserted before an isolate of a personality facet of level 1 in any round. This rule is prescribed in the belief that there is no possibility on the idea plane calling for a posteriorising common isolate of the personality facet of the first level in any round. If it calls for it, the special rule mentioned above will have to be deleted.

215 In the posteriorising common isolate number in matter facet, a proposed rule prescribes that the initial Roman capital given by the quasi-subject device should be replaced by the corresponding Roman small.

216 Any space or time isolate is a posteriorising common isolate. This has been shown in Ranganathan's Report 4 to FID/CA (1954).

221 The only recently recognised main classes, bypassing the division into traditional main classes, given in CC are:-

1 Knowledge Universe
2 Library Science
3 Book Science
4 Journalism.

217 A schedule for private time and seasons has been proposed in Ranganathan's Depth classification (3), published in the Annals, 1954, 65-80, and in the Prolegomena, section 4535.

224 Three cells are set apart for the special isolates of Energy to be got by enumerations. It will be helpful if each cell can be specialised for a particular purpose. Vickery has suggested, that different kinds of manifestation of energy will have to be recognised. He further suggested different energy facets to meet this situation. In the Prolegomena, the different kinds of manifestation have been called Auto-Action, Human Manipulation and Reciprocal Action. It also suggests that these three kinds of manifestation may be accomodated in the three cells mentioned above one in each. This specialisation in the use of the three cells need not however be the same in all the basic classes. Literary warrant will decide the most helpful specialisation. For example, in "L Medicine" the region (21) is made to specialise in auto-action; in "E Chemistry" it is made to specialise in human manipulation.

242 The isolates shown in the cells of column 1P1 form a single facet, only as viewed from the notational plane. It is in reality a telescoped facet as viewed from the idea plane. This has been explained in Ranganathan's Depth classification (12) published in the Annals 2, 1955, 65-78, and the Prolegomena, .section 367.

261 It has been recently proposed that the cell{(41), (BC)} may be used for newly emerging main classes, representing pure methodology. Such a methodology, it is believed, can be associated more or less appropriately with an already existing class number. Indeed it has been described as a "distillate main class". The packet notation with quasi subject device is therefore prescribed to represent such a main class. This is more fully discussed in Report 5 and in the Prolegomena, section 3614.

Here are some examples:-

(a) Art and Science of building Bibliography.

(k) Art and Science of Composing Encyclopaedia.

(w) Art and Science of Writing Biography.

(M) Methodology of Standardisation.

(P) Methodology of Communication in the general sense.

(X) Management in general.

(Y) Public Relations.

263 The number of isolates of Material is bound to be very large, considered as a whole. However, for any particular basic class certain materials will be the favoured ones. These may be specially enumerated in octave 1, of zone 3 and in the last ocatave. However, some other materials may also have to figure occasionally in a subsidiary manner. It is difficult to anticipate all these secondary materials and include them in the enumerated schedule of each basic class or leave them to be represented by the alphabetical device. It is therefore suggested that a more or less exhaustive enumerated schedule of materials may be constructed, making the entire base of the notation Roman small, Arabic numerals and Roman capitals — available for being packeted within brackets. The cell{(41), [1M1]}may take this schedule. Using a group notation of three digits, the number of materials that can be thus scheduled will be of the order of 200,000. Using a group notation of four digits, the number of materials that can be scheduled will be of the order of 12,000,000. This is a large enough number for all possible materials including perhaps even brands in some cases. It should be possible to make each group digit significant in other words to group the material into more or less homogeneous groups. This is a piece of work awaiting to be done.

264 The cell{(64), [1E]}may be used to accommodate energy isolates in excess of those enumerated in the earlier zones of the array. It is believed that subject device will be the best method for constructing these packeted numbers. But if experience would require it, it might be possible to construct the packeted numbers by enumeration.

27 Five of the cells in the space and time column are marked 0; these are not available for occupation. This is the result of the pres-

cription of the same connecting symbol — viz. dot — for both the fundamental categories, space and time. This prescription is merely a result of the number of punctuation marks other than hyphen being only four. Here is a tyranny of the notational field. However, since space and time generally occur together it is believed that no difficulty will be caused. If experience proves otherwise, it will be necessary to improvise a fifth connecting symbol. As it is, the rule prescribes the initial digit of a space isolate to be an Arabic numeral; and that of a time isolate to be a Roman small or a Roman capital. This distinguishes the two fundamental categories, space and time.

271 There is another consequence of using Roman small to represent private time and seasons. It becomes impossible to have a posteriorising common isolate of space or time. But this is only an illusion. For as stated in section 216, all space and time isolates are posteriorising common isolates.

28 Seven of the cells are marked "?"; but in reality they are only six. Because we can occupy only cell{(41), [S1]}or cell {(41), [T1]}, but not both. This is a consequence of the presciption of the same connecting symbol viz. dot for both the fundamental categories space and time.

281 The two fallow cells in the column (BC) may be reserved for any main classes that may take shape in future.

282 No use is at present found for zone 4 of array of order 1 in the facet [1P1].

283 It is difficult to find a suitable use for the penultimate octave in array of order in [1M1]. It is for consideration whether matter isolate may have to be denoted by chronological device. Generally, materials get trade names or brand names which are universally used in all languages. Therefore, they will all be accomodated in the last octave. However, if there are special materials of brands not having an international nomenclature, it may be necessary to denote them by chronological device and accomodate them in the penultimate octave.

285 A possible use of the penultimate octave of the array of order 1 in [S1] is (SQI)(E). Division on the basis of latitude and longitude is a possibility. Here the equator and the Greenwich meridian are the conventional axes of co-ordinates. But it may be necessary to have other sets of axes for other purposes. For example, air navigation may require some other Great Circles as co-ordinates.

286 No use could be found at present for zone 4 of array of order 1 in either [S1] or [T].

3 ARRAY OF ORDER 2

Isolate numbers got by alphabetical device, chronological device, and packeting device have the status of a single digit, whatever be the number of digits occuring in them. The same is the case with anteriorising common isolates and posteriorising common isolates of personality, matter, and energy. Thus generally speaking an array of second order is possible only if the digit in the array of order 1 is an Arabic numeral. This is in respect of arrays of facets. However, in a basic class, there can be array of order 2 even when the digit in the array of order 1 is a Roman capital or a packeted number. The following is the efficiency table for array of order 2:-

NOTES

31 The penultimate and the last octaves of array of order 2 in a basic facet are not available for canonical division, as they are used for specials and systems.

316 No use has been found till now for zone 4 of array of order 2 of a basic facet.

32 The packet notation for zone 4 of an array of order 2 of [1P1] or [1M1] may have to be by enumeration or subject device or quasi-subject device, according to the host class.

34 One of the postulates is that an energy facet cannot have more than one array. This accounts for the zeroes in the column [1E].

36 No use has been found till now for the four cells shown fallow in column [T1].

Efficiency Table for Array of Order 2

	(BC)	[1P1]	[1M1]	[1E]	[S1]	[T1]
(11)	(ACI)(E)	(ACI)(E)	(ACI)(E)	(ACI)(E)	(ACI)(E)	(ACI)(E)
(21)	(CS)(E)	(SI)(E)	(SI)(E)	0	(SI)(E)	(SI)(E)
(22)	(CS)(E)	(SQI)(E)	(SQI)(E)	0	(SI)(E)	?
(32)	0	(SI)(CD)	(SI)(CD)	0	Orientation Division(E)	?
(31)	0	(SI)(AD)	(SI)(AD)	0	Non-contiguous Political Group(CD)	?
(41)	?	(CI)(P)	(CI)(P)	0	Non-contiguous Subject Group (PSD)	?

37 The above efficiency table is applicable to the basic facet only in the case of the main classes B Mathematics, C Physics, perhaps D Engineering, H Geology and R Philosophy. The main classes F Technology, M Useful Arts and N Fine Arts require a different kind of efficiency table. The other main classes have only one array in the basic facet. Therefore, these basic facets cannot have an efficiency table.

4 OTHER CASES

The above is only an indication of the possible use of efficiency table. It is all over-simplified in respect of arrays of order 1. Section 37 has shown the complications that begin in arrays of order 2. There will be even greater variety of experience in arrays of higher order and in levels and rounds of higher order. A common efficiency table may not be possible.

DEPTH CLASSIFICATION

18. PROPAGATION IN AGRICULTURE

D. B. KRISHNA RAO

Indian Council of Agricultural Research, New Delhi

Enumerates the various methods of propagation employed to multiply plants. Considers 'Propagation' as a manifestation of 'Energy' Fixes its isolate number in [1E] according to helpful sequence.

1 INTRODUCTION

Plants have been growing and multiplying for millions of years. With the domestication of plants man began to watch the methods by which plants were found to increase in nature. He studied their detail. He experimented on them. He helped and even modified the process to his economic advantage. This led to the accumulation of a vast amount of literature on propagation methods.

2 DEFINITION

Different methods are employed to multiply plants. Propagation denotes these methods. The methods under cultivation are in essence the same as those found in nature. These are by spores, suckers, bulbs, tubers, underground stems, runners, cuttings, layers, grafts, buds and seeds. All these are found in nature except budding. It is true that grafting is an accident in nature. It does not lead to increase in the number of plants. However it is not uncommon in nature. Some times branches of two growing trees have come in contact. Where they meet, the bark of each one gets abraided by the other. The branches come into close contact in this region. There is growth of tissue from both the branches establishing complete organic union of the two branches, thus making a natural graft. It is observation of such cases that led to the use of grafting as a method of propagation.

Propagation by seed is the most widely employed method. This is too well known to need any description. The essential feature of the other method is that a vegetative part of a plant is induced to carry on a separate existence and grow into the adult plant. Therefore these methods are called vegetative propagation. Very often identical progeny of the plant desired is not obtainable by seeds. Further seedlings take a long time to reach maturity than plants from vegetative propagation. Therefore vegetative propagation is necessary in a large number of plants of horticultural and agricultural importance. Sugarcane is a well known example of a highly economic plant propagated by cuttings of stems which produce shoots at the nodes.

3 ENERGY

Examined in the light of the ideas in section 3 on soil (An lib sc 1955, 2, 41), propagation approximates to a process or function or operation or a method. In fact it is one of the two major life processes growth and reproduction, artificially helped by man. Therefore, 'propagation' is to be considered as a manifestation of the fundamental category 'energy'

4 MATTER

'Propagation' being an action or a process, does not lend itself to be considered as a constituent of any other commodity.

5 PERSONALITY

Propagation is effected by operating on one or the other of the organs of a plant. These are root, stem, leaf, bud etc. Applying the ideas in section 5 of my article on soil (An lib sc 1955, 2, 41), it will be seen that each one of these entities is a manifestation of the fundamental category 'personality'.

At first sight each one of the organs may appear to be (W) [P]. But it is not so in this context. In propagation the organ operated upon is subjected to helpful treatment and nursed with great care. Its importance is due to its intrinsic value as being the source or starting point for a new plant. It is not to be viewed as part qua part of a plant. It forms the first level universe with which we start for the new generation. Therefore it is (W)[P] and not (W̄)[P].

6 APPROACH

Ideas in section 6 of my article on soil (An lib sc 1955, 2, 42) apply more or less to propagation also. The traditional or canonical approach demands that in the arrangement on the shelves and in bibliographies literature on propagation qua propagation without relation to any specific crop or group of crops should be placed anterior to that on propagation of any specific crop or group of crops. Further, the earliest agricultural operation that begins with the handling of the crop proper is propagation. Therefore it is considered helpful if literature on propagation follows closely in sequence to soil and manure.

7 FIRST ROUND FIRST LEVEL PERSONALITY

As already seen in my previous papers, there is no place in the first round for the W P foci of organs. We have to examine later rounds.

8 SECOND ROUND FIRST LEVEL PERSONALITY

Isolate number 3 in [1E] is denoted by the term 'propagation'. (W)[P] organ foci are all germane to it. Energy focal term should denote method or process. Section 2 above shows that it is so. Therefore the term 'propagation' lends itself for being used as the substantive term for the [1E] isolate number 3 Accordingly J:3 = Propagation.

[2P1] is to accommodate foci which are agents of [1E]. These agents may be causal agents. They may also be agents with which we effect or accomplish [1E]. (WP)[P] foci of organs are the agents of [1E] isolate number 3. Therefore they are to be accommodated in [2P1]. Thus the facet formula for propagation with its agent is J:3[2P1]. We get the following sequence:-

J:1 [2P1]
J:2 [2P1]
J:3 [2P1]
J [1P1]

The result is that literature on propagation qua propagation without relation to any specific crop or group of crops, will get an anterior position to literature on propagation of any specific crop or group of crops. Further propagation follows closely in sequence to manure. This position for propagation is in accord with the demands of traditional and canonical sequence in agriculture.

OPEN ACCESS IN LIBRARY

1. SOCIAL FUNCTIONS OF LIBRARY

S. R. RANGANATHAN

Gives a list of definitions of terms used. Enumerates eight social functions of library. States the Five Laws of Library Science and shows their implications on the various types of libraries.

1 PRELIMINARIES

11 Terminology

111 Thought - An assumed term.

112 Work - Thought expressed in language and/or symbols or in any other mode, and thereby made communicable.

113 Document - Record of work on paper or other material, fit for physical handling, transport across space, and preservation through time.

A document is usually distinguished into book, periodical, and serial such as almanac, directory, and yearbook. Precise definitions of these terms are necessary in the study of Library Science. Such definitions are given in Ranganathan's Heading and Canons : comparative study of five catalogue codes (1955). There a book is further distinguished into simple book, composite book, ordinary composite book, and artificial composite book. This is necessary in the study of classification and cataloguing. For the study of open access, it is helpful to distinghish documents on the basis of their physical make-up, into the following categories

114 Book - A document with an independent physical existence, made of fairly durable paper, bound more or less strongly, of size comfortable and safe to handle - i.e. with height, width, and thickness within prescribed limits - available in several copies, and neither rare nor of unusual bibliographical, sentimental, or monetary value.

115 Abnormal Document - A document with an independent physical existence, but lacking one or more of the features prescribed for a book.

It may be a pamphlet, a miniature volume, a giant volume, a volume on art paper or any other weak paper, a rare volume, an out-of-print volume in demand but not likely to be republished, a volume with unusual bibliographical, sentimental, or monetary value, a volume with too many plates, a rare volume, a gramophone record, or any other physical embodiment. A book may also be declared to be an abnormal document, by law or regulation of a library, for a specified period or permanently, and be made available only for restricted use; a textbook, much in demand, is an example.

116 Micro Document - A document forming part of another document and without its own

independent physical embodiment, or an equivalent one such as a pamphlet, a reprint, or a clipping embodying only specialised thought of narrow extension and great intension, though with an independent embodiment.

An article in a periodical, a contribution to a symposium or any other kind of composite book, or part of a book is an example of micro document.

117 Library - An institution collectively owned and maintained by a community - be it a nation, local body, education institution, research institution, business organisation, government department, or any other corporate body - holding a collection of documents for the use of the members of the community and to such others as may be allowed by it, and charged with the duty of promoting adequate and proper use of the collection by all the members of the community.

From this point of view, a library may be described as a socialised collection of documents. A copy of a document in a library may itself be described as a socialised document.

1171 Public Library - A library open to the general public residing in an area.

1172 Institutional Library - A library open only to the members of the institution for whom it is maintained.

1173 Service Library - A library with service to contemporaries as the primary purpose.

1174 Dormitory Library - A library with preservation for the use of posterity as the primary purpose.

12 Social Institution

The definition given in section 117 excludes a private collection of an individual or of a family from the connotation of the term 'library' as used in this study of open access. It is essential that the collection is for the use of all the members of a specified community or corporate body. In this sense, a library is a social institution. It is a social institution in another sense also. It is established and maintained as a help to the promotion of social wellbeing, continued social betterment, and cultural continuity. Thus a library is a multipurpose institution.

13 Eight Purposes

The social function of a library has never been a single one. It has been added to from time to time. The emphasis has shifted from one function to another from time to time. The future may also bring new functions. The emphasis too will shift. Today the following eight functions are recognised:-

1 Preservation of documents for posterity;

2 Promotion of use of documents by contemporaries;

3 Provision of equal opportunity to all to benefit by the use of documents;

4 Provision of a means for beneficial use of leisure time;

5 Provision of a means for the conservation of research potential;

6 Promotion of productivity drive;

7 Promotion of the conservation of natural and industrial resoruces; and

8 Promotion of peaceful co-existence within a community and among nations.

14 Advent of Printing

In the pre-printing days, each copy of a book had to be written by hand. It was a long, tedious, and costly process. Many a book had only a single copy. No book had copies sufficient in number to take away from it its rarity value. Therefore, the emphasis was naturally laid on the first function. To preserve it, a book was even chained to the shelf by some libraries. But after the advent of printing, the second function of promotion of contemporary use became more practicable. With the invention of machinery for paper-making, printing, and binding, this function came to be actively discharged by the library world. This trend began to develop in the second half of the nineteenth century. Since then the first two functions came to receive equal emphasis.

15 Advent of Democracy

About the same time, democracy began to permeate country after country. As a social principle, it insisted on equal opportunity for all. This insistence permeated the library world also. The right of each person to have free access to books in the measure of his capacity to read and benefit by them has now come to be accepted. Books have come to be truly socialised. Again, as a political principle, democracy distributes sovereignty among all the persons of a nation. Therefore, the democratic form of government depends for its success on the informed enlightenment of every citizen. This has made the state interested in the diversion of the leisure time of everybody towards profitable self-education. This has led to the library taking up the third and fourth functions listed in section 13.

16 Advent of Population Pressure

The twentieth century is witnessing population pressure reaching beyond the capacity of the more or less free gift, by nature, of food, clothing, and building materials. These have now to be supplemented by materials synthesised out of those not fit for use in their native state. Moreover, the raw materials and the intermediate or the ultimate commodities have to be carried quickly across the surface of the earth, before losing value. These factors have necessitated the conservation of the research potential of humanity. We cannot any longer indulge in each gifted man doing his own research in isolattion. Research has to be done in series, as it were, by large teams spread over the earth. Unintended and unnecessary repetition of the same work by different persons has to be avoided. Further the time of the research team has to be saved from being spent on search for embodied knowledge. These factors have made a library assume the fifth function. It has to help in the conservation of the research potential of humanity.

161 Productivity Drive

To enable society to get the full benefit of the discoveries, inventions, and technical developments made from time to time by research teams, the technician and the common worker have to be constantly kept informed and self-educated of the latest methods of work. This step in Productivity Drive has come to be recognised during the last few years. Efforts are being made to produce literature written in a style suited to them. They are not intellectuals who can take to books voluntarily. This has made the library play a new part to help in the Productivity Drive. This part takes the form of aggressive reference service and extension work.

162 Conservation of Resources

Again, population pressure calls for the conservation of the resources of the world. This requires no doubt proper planning by the state. But it also requires that every citizen should be educated in the rational utilisation of materials and avoidance of waste. To conserve the material, plant, animal and industrial resources, the co-operation of everybody is necessary. For this, everybody has to be helped to inform himself in the matter through self-education. The library has naturally to be an important agency in this matter. This is now beginning to make the library exercise the seventh function.

163 Peaceful Co-Existence

Centuries of more or less isolated existence has left a legacy of the chain of mutual ignorance, suspicion, fear, and violence among communities. This has begun to lessen among the communities within a nation; but, it still persists between nations. The Identity in man is occulated by the differences in their respective physical peculiarities such as colour and cultural practices. Socialisation and circulation of the spontaneous thought and warblings of the thinkers of each nation among the people of all other nations can help in penetrating through these more or less superficial differences and reaching at the verities of Identity lying deep in the hearts of all. Bad thought, laid bare to world-community, will get sterilised. Good thought, circulated among the world-community, will lead to the creation of better thought. In this process, the library can function as messenger of light. In our own lift-time, the library is beginning to take this up as its eighth function.

17 Normative Principles

To-day, all the eight functions have to be fulfilled with equal emphasis by the library system of a country. Library practices have to be developed systematically and purposefully with all the social purposes in view. This will have to be a continuing process responding nimbly to changes in social demands. This is best done if their evolution is based on library science. Library science falls within the domain of social sciences. Therefore it has to include, in its cycle of scientific method, normative principles instead of hypotheses. The following normative principles are assumed. They were formulated in India in 1928. They were published in 1931 in the book Five laws of library science. These are

1 Books are for use;
2 Every reader his book;
3 Every book its reader;
4 Save the time of the reader; and
5 A library is a growing organism.

The Library manual, published in 1953, gives a more rapid account of these five normative principles.

18 Library System

The eight social functions of a library do not all work in the same direction. A single library can not discharge all of them. To reconcile all the different functions, a country has to develop different kinds of libraries and to weave them into a national library system. This is a major problem in library organisation.

181 National Central Library

The National Central Library is to specialise a dormitary collection. The "Every" in the Second Law, as applied to it, places emphasis on the future generation rather than on the present. To give effect to this, the "Every" in the Third Law, as applied to it, is usually brought into full force in respect of certain materials such as newspapers, serials, textbooks, fiction, and cheaper books, only after the lapse of some years after their acquisition. Some lenience is shown in the fulfilment of the Fourth Law also. In regard to the Fifth Law, a National Central Library grows in size for ever. In this respect, the growth of its collection is like that of a child. Consequently, the growth of its shelf space and of its stack-room has also to be like that of a child. The growth has to be continuous addition to size. In a big country or in one with several languages, the National Central Library may have to be supplemented by a number of Regional Central Libraries. In India, the name State Central Library has been used in the Library development plan (1951) to designate a Regional Central Library.

182 Service Library

A Service Library does not pay particular attention to the first function. Its main concentration is on the second function, viz. use by contemporaries. As applied to it, the "Every" in the Second Law emphasises everybody of the present. So also the "Every" in the Third Law emphasises the documents with live interest in the present day in preference to the outmoded ones. The "Growing" in the Fifth Law connotes adult-growth — that is, growth by replacement of documents rather than continued increase of the size of the collection. In other words, we can postulate a ceiling to the size of the collection and to the stack-room space. Among service libraries, two kinds may be distinguished: those specialising in the service of microdocument, and those specialising in the service of book. The former is used by specialists; and the latter by generalists, if we can use this word coming into currency in the American language.

183 Business Library

The library specialising in the service of micro document is very selective in its clientele and in its documents. Within this restricted range, it seeks to satisfy Laws 2, 3, and 4 to as near to perfection as possible. The librarian of such a library should know intimately each one of his readers and each one of his documents, as if there were only one reader and one document. The absolute size of its collection is usually smaller than in any other kind of library. Discarding of outmoded material is done drastically and frequently. It may 'not put any restriction on the number of documents lent out to any reader at any one time. Similarly, it may abstain from putting any restriction on the time for which they are lent out. It is usually owned by a body or institution engaged in production, commerce, research or administration. Its main objective is the fifth function. There is now a trend to have the sixth function also attached to it. Indeed, productive drive can be effective only if both of the functions 5 and 6 are carried out with equal efficiency. A library of this kind may be called a Business Library.

184 General Library

As against a business library, we have the General Library. Its clientele is usually large. It consists practically of the entire public of a locality or of an educational institution. It concentrates more on the service of books than on that of micro documents. Its books are mainly selected with an eye to functions 3, 4, 7 and 8. In other words, elevating recreative study, general information and enlightenment, and promotion of civic sense, and sense of world-state are its chief objectives. Its ceiling to the size of collection or stack-room is much larger than for a business library.

185 National Pool

The differentiation into dormitory, business and general library is only a matter of emphasis. It is seldom that we have a pure specimen of any kind. But, generally speaking, the library practices of the different kinds of libraries, in regard to book selection, book-weeding, and service to readers, different from one another. Moreover, the present trend is to regard the book collections in all the libraries in a country as if they form a single national pool. Except for the documents in the dormitory collections, a great mobility obtains in the case of books. Inter-library loan, and even inter-library transfer are being freely practised among the libraries in a country. This is a consequence of the great weightage now being given to functions 2 and 3 as applied to the library system of a country taken as a whole. The service libraries of a national system act on the belief that the destiny of a book is the hands of readers. Book is regarded as thought energy packed and kept in a latent state. The business of a service library is to bringing it into an active state, so that it may irradiate every human mind and get itself enriched, by the new thought created by the readers. One of the endeavours of Unesco should be to coordinate the different national library system into a world-library-system. At present, it is more an ideal than a reality. But a test for the different national library systems having discharged the eight function satisfactorily is the realisation of an organic world-library system.

(To be continued)

PUBLIC LIBRARIES
IN THE GERMAN FEDERAL REPUBLIC *

GERTRUD GELDERBLOM

Frankfurt

Traces the early influences and the stages of development of public libraries in German Federal Republic. Gives an account of the facilities offered by public and rural libraries, the need for library legislation, the nature of professional training and professional activities.

0 BACKGROUND

From the beginning, the German libraries (Germany as a whole) show a remarkable variety of forms. Communities, districts, provinces, the Laender, civic and political educational societies, industrial plants and religious leagues share in its development, which started in the middle of the 19th century. At that time, the public libraries were institutions of welfare, supported neither by State, nor community, but by societies founded under the influence of energetic personalities. Religious groups as well, undertook this new work. Around the middle of the century (1845) the "Borromaeus-Verein" was established as a result of the educational endeavours of the Catholic Church, with libraries in parochial homes and parishes which later developed to public libraries, especially in the catholic parts of the country. The Protestant Church also founded Protestant libraries.

1 EARLY INFLUENCES

In the nineties, libraries developed under the influence of trends in national education, that were aimed at a wider participation of the people in the forming of society. The influence of the well-developed English and American public libraries was felt. The "Public library movement" (Buecherhallenbewegung) established many municipal libraries. At this time the library took over the function of an educational library, which served all classes of the population. From now on the idea gains ground, that the public library is an institution of its own, that it is separate from the scientific library and needs its own forms of organization and its own specially trained library staff. At the same time, work's libraries were founded by individual industrial firms for their employees, similar to the public libraries. They attain an important position in Germany and have to be considered, as well as the parochial libraries, an addition to the public libraries. However, this variety of library forms with their different educational and cultural aims, offers, apart from various problems, the special chance of diverse effectiveness. In the 20th century the libraries of the civic and political educational societies of the 19th century were frequently taken over by the communities. A survey of the German libraries must be based on the public libraries, because they carry the greatest weight in the general picture. They are the greatest in number. They have the largest book-collection. Their readers are people of all ages and classes. Here, up-to-date library methods are being developed with the assistance of more than 2000 trained librarians.

---

*Translated by Ruth Ardian, U.S. Information Center, Frankfurt

2 AFTER WORLD WAR 1

Before, and especially after the first world war, the municipal libraries developed methods that are still constitutive for the modern organization of the library. Thus there are central libraries with branches, children's or young people's libraries, bookmobiles, hospital libraries, reading rooms for adults, work with prison libraries, youth organizations, schools, adult education programs, etc. The rural libraries, always somewhat behind in the development are being established and supported by the so called "Buechereiberatungsstellen"*, stateside organizations with a supervisory function and trained personnel; while the rural libraries as such are being administered by teachers, employees of the community, or other people interested in library work. The two leading personalities in the first decades of the 20th century were Erwin Ackerknecht of Stettin, and Walter Hofmann of Leipzig. Both tried, though by different ways, to find out about the motives of reading, the influence of books and reading and about the mediating role between reader and book. Both agreed in their demand for a moral consciousness that must find expression in a book, for the preservation of purity in cultural media. It is typical that book evaluation and critical book reviews take up the largest part in the German professional periodicals. The period of the national-socialist regime also is felt in the public library through strong centralistic tendencies, that impaired the cultural value of the library to a large extent.

3 AFTER WORLD WAR II

After the second world war the public libraries were much weakened. Book losses through war damages and their effects in consequence of the German collapse amount to many million volumes. Besides the losses in books, the number of which is not exactly known there were extensive damages to buildings and furniture. In some places nothing has been left over of the former equipment, so that one had to begin from the ground up. Soon after the war, with few books in insufficient rooms the public libraries had to serve many more readers than before. People had lost their private libraries. Fewer people than before can own books nowadays. The reasons are loss of property after two wars, levelled incomes, lack of space, other needs that have a prerogative, also a changed relation towards property. Therefore the public libraries have to cover a wider field than before. The use of the libraries has increased since reconstruction is progressing and funds from the community flow more abundantly. Apart from this, another danger overshadows reading: trashy literature has gained ground. Slowly the public realizes the value of good and sufficiently supplied libraries for children and young people in the fight against trashy literature.

41 State Support

The reason for a still prevailing aloofness of the public administration is to be found in the historical development of the public libraries. In the realization that "there is principally no disagreement that libraries in the communities are worth supporting", this aloofness from the administration has lessened considerably after 1945. This is largely because public librarians endeavour to carry the subjects State, Community, Library, Librarians by all ways into the public. The better administration is marked by the fact that larger funds have been made available. The state, carrying legal responsibilities, sponsor the libraries through 27 so called "Buechereiberatungsstellen", that serve the smaller communities in the country. However, the state has only a supervisory function.

42 Library Legislation

The German experts think that the relations between state and library could be made much closer through a public library law. Thus in the Federal Republic - and now of her only we are talking - drafts for a library law have been presented in the various German Laender: Schleswig-Holstein, Hesse, Wuerttemberg-Baden, Berlin. There will be no Federal law, since cultural work is a matter of the individual Laender and not of the Federation. Therefore there is again the possibility of a divergent development within the Laender, quite apart from the separation of the German libraries as a consequence of the separation into Western and Eastern Germany. In the long run the construction and safeguarding of efficient public libraries is not possible without having a public library law. This has been proved by the example of well-constructed library systems in the progressive countries of Scandinavia, England, and the United States. Experts in the Federal Republic consider a law that encourages to be more favourable than a law of compulsion.

---

*This corresponds approximately with county libraries

43 Public Support

Apart from state and town, society is one of the responsible forces of public library work. Even if the library has not come into full display before the public yet, there is a growing responsiveness from the citizens who in some places have asserted their lawful claims for a library. This a new situation in our country. It can be regarded as a result of the democratic development and education of the last years. The most important agent between reader and book remains the librarian, who of late has appeared much more in public in order to contact other social groups. Also, he applies new methods of approach i.e. advertising, co-operation with local libraries, Interlibrary loan, participation in union catalogs, work with youth welfare offices, schools, etc. All these procedures are on different levels of development and depend on local conditions.

44 Rapid Growth

In general it can be said, that the public library is in dynamic motion. It is not even an exaggeration to contend that we have reached the age of the Public library. Some figures of the year 1953 throw light on this. 122 building projects were completed in 73 libraries of all sizes. 69 building projects are under construction. The following towns should be mentioned among others because of their fine buildings and arrangement: Hamburg, Bremen, Duisburg, Essen, Muenster i.W., Gladbach (Muensterland), Bocholt i.W., Oer-Erkenschwick, Frankfurt am Main, Offenbach, Hanau, Stuttgart, Muenchen, and Augsburg. One of the most modern libraries not only in Germany but also in Europe is the Memorial Library in Berlin, a donation of the United States in memory of the Berlin blockade of 1948. This library was handed over to the citizens of Berlin in the autumn of 1954.

51 Open Access

Since 1945 the German librarians tend more and more towards the open-shelf system. Free access to the shelves as an up-to-date arrangement for the reader, readers' own selection of books, are in accordance with a citizen's liberal attitude in a democracy. The open-shelf system is not quite new in Germany, though. After all, 25 open-shelf libraries in different places were registered at the end of the Twenties. Of course the institutions of the Occupation Forces, The United States Information Centers, and the British Centers have not been without influence, the same as the informatory visits of many German public librarians to England, the United States, and Scandinavia have hastened the pace of the development. Some figures of 1953 show the change effected. In 66 towns there are 158 open-shelf libraries, another fifty towns plan a re-arrangement according to open-shelf system.

52 Book Collection

The book collection consists of literature imparting education, information, and recreation. There is a lower limit in fiction, that still has literary and ethical value. Apart from the belles lettres, the collection is more and more dominated by the whole field of philosophical and natural science and various literary groups of practical life, even if a separation from the real tasks of scientific libraries is being observed. The collection should always be built up in order to satisfy all needs.

53 Children's Literature

Special emphasis is being laid on children's literature, starting with books for the fairy tale-age, and for young people in the transition period between 14 and 17 years of age. The children's libraries are supposed to form a positive antidote against trashy literature.

54 Free Access

A number of progressive libraries, so far 12 towns, followed the foreign example and dropped fees. Most of the libraries are allowed to be rather generous in raising fees. From many groups of the population no fees are being taken, i.e. from children, young adults, pupils, students, and all persons undergoing educational training, as well as persons without earned income.

55 Extension of Opening Hours

The growing number of patrons require an extension of opening hours, which though this has already been done all over the Federal Republic, does not suffice by far. In no way does it come up to the examples of countries with a well built-up library system. The essential fact is, that opening hours have been extended toward the evening in consideration of the working population. To cope with the growing service, the German experts are trying to rationalize their procedures, in order to fulfill their educational task. Rationalization includes internal work, and work with the public in the municipal libraries, from the viewpoint of saving manpower and material.

6 PRESENT STATE

The following figures for the financial year 1952/53 show the development and the present state of the public libraries in the Federal Republic. The data from libraries in places with more than 20,000 inhabitants served as a basis. Complete statistics is not available at the time the article is written. In any case the results up to now are illuminating. The preliminary statistics shows the following figures for the Federal Republic:

The number of communities with libraries	6800(estimated)
Number of communities with trained personnel	242
Number of residents in the places with libraries	32,121,760
Number of volumes	6,680,051
Number of circulation	23,018,935
Expenditure	20,686,873[5] DM

The Memorandum of the German Unesco-Commission register the following figures for 1950/51 that are exceeded by far by the above mentioned statistics.

The number of communities with libraries	6512
Number of residents in the places with libraries	31,745,000
Number of volumes	5,159,636
Number of circulation	13,892,026
Expenditure	10,112,470 DM

These figures have increased again in 1954. It is known, that the quota of children's books of the total circulation in most of the large cities is 30-40%, even 50% and more. In most of the cases this does not correspond with the size of the book collection. The turnover of the children's books is too frequent and too fast. The young readers amount to 34.4% of the total number of readers. In many of the large cities this figure is exceeded by far.

61 Rural Libraries

In order to urge the development of rural libraries, the "Staatliche Buechereiberatungsstelle" set up a permanent conference of experts in 1952. A commercial installation of communities and Laender is the "Einkaufszentrale fuer oeffentliche Buechereien GmbH", in Reutlingen. This distribution centre serves a twofold purpose: to provide an ever available stock of those books which correspond to the special tasks of the modern public library, these books get a special sturdy binding, that meets the requirements of the library of today. The evaluation of books is made by many public librarians who regularly review books. The book stock is advertised through lists of offers. The distribution center offers only those books that have been favourably reviewed by experts.

Besides, it has taken over various superordinate tasks, cataloging of books and supply of book cards with title, subtitle, selected booklists for young people from 14-18 years, etc.

7 PROFESSIONAL TRAINING

Professional training is governed by stateside regulations. There are special library schools: the South-German Library School, Stuttgart, the Library School of the Hansestadt Hamburg, the Library Training Institute of the Land North-Rhine-Westfalia in Cologne, and the Berlin Library School (Western-Berlin). The libraries of the Borromaeus-Verein, and the Protestant parochial libraries train their own personnel, the former in Bonn, the latter in Goettingen. Curriculae of the stateside library schools have been assimilated. The condition for admission to professional training is graduation from a High School (Abitur), with a good report in German. Applicants with university background are being granted a reduction of the training period. Special training for children's librarians and music librarians is provided. The professional training lasts three years. It is split up into three semesters at a library school and three semsters of practical work with different types of libraries that are qualified to train librarians. According to a recent arrangement the apprentices of the public library spend a certain time (at least four weeks) with a scientific library. Here it should be mentioned that it has lately been realized that the scientific library is the partner with whom a number of problems have to be solved and can be solved. The diploma of each school is valid for the whole area of the Federal Republic.

8 LIBRARY ASSOCIATION

The German public librarians are associated in the "German Public Library Association" (Verein deutscher Volksbibliothekare). Groups in the individual Laender work at their local affairs, that are then coordinated in the association. Another overall organization is the "Association of German Libraries" (Verband deutscher Bibliotheken), which was constituted at the suggestion of the "Deutscher Staedtetag". This association serves as a parent organization for all libraries in the Federal Republic. However, not all libraries are its member so far. The association aspires a cooperation between all institutions in the entire field of library work and tries to unite them. It supplements the superordinate work for the advancement of libraries, that is being done by all associations of this kind v.ch-in their range, their local districts and the Laender.

81 Professional Publications

Among the publications about the German library the "Handbook of public libraries"[1] should be mentioned. Except for a directory of libraries and librarians it contains statistical data on the public libraries in the Federal Republic, the names of stateside departments and officials, a directory of "Buechereiberatungsstellen", library schools, circulars issued since 1945 by the Laender concerning public library work, statutes of the association, etc.

82 Professional Periodicals

The periodical "Buecherei und Bildung", is published by the association of the German public librarians. At present it contains besides professional articles, about 250 book reviews by public librarians in each issue. The latest publication of the German book production, including translations are being discussed on a wider basis than in any other periodical. A short time ago a column was introduced, called "Public Opinion" which proves that public interest in library work is growing. The "Mirror or Periodical Articles" evaluates literary, general, and socio-political periodicals for information and to assist in getting a general survey of the intellectual situation of our time. The chronicle concerns reports from the libraries of the Federal Republic. The illustrations are meant to set an example and have stimulating influence upon the public. Representatives of public life too supply articles. It might be said that our work is outgrowing our profession these days.

83 Printed Catalogues

Among the publications there are also many printed catalogs that are not centrally provided but prepared by individual libraries. There are fiction booklists, children's booklists, and selected catalogs which are of special appeal, if arranged by subject. Basic publications are: Hans Hugelmann's "The Public Library"[2], and Lilli Vollbehr's "The open-shelf library"[3]. Both works have an extensive bibliography.

9 International Cooperation

Contacts between the German public librarians and foreign countries are very lively. The communication with UNESCO is being made by Director Dr. Langfeld, Cologne, the contact to IFLA (International Federation of Library Associations) by the writer of this article. Visits to foreign countries have been made and are continued, especially to the United States, England, and Scandinavia. American experts have stayed in the Federal Republic for several weeks for informative visits. The exchange of trained personnel for a longer or shorter period inside the country, in Europe, and overseas is made. Visits from colleagues from all parts of the world, especially from Europe have lately become more and more frequent.

To sum up it is perhaps charateristic to quote an American librarian after her visit to the libraries of the Federal Republic. Mrs. Stevenson from the American Library Association in Chicago wrote after her return that the construction of the German public libraries must be "exciting". And it really is exciting; Our libraries are on the move.

---

1 Handbuch der Oeffentlichen Buechereien, in Zusammenarbeit mit dem Verband deutscher Bibliotheken, hrsg. vom Verein deutscher Volksbibliothekare, Hamburg, 1952, 168 S.

2 Hans Hugelmann. Die Volksbuecherei, Wesen, Aufgabe und Organisation, Stuttgart, 1952, 280.

3 Lilli Vollbehr, Die Freihandbuecherei, Wesen und Technik, unter Mitarbeit von Ruth Sierks, Hamburg 1953, 288 S.

203557

DOCUMENTATION IN MANY LANDS *

4. DOCUMENT : CONVENTIONAL AND NON-CONVENTIONAL

S. R. RANGANATHAN

Traces the paper to the impact of the Brussels Congress, 1955. Starts with the definition given in Heading and cannons (1955). Analyses the conventional and non-conventional documents covered by it. Describes a new species of document created by instrument-records of phenomena unmediated by human intellect. Extends the definition so as to include the new species. Examines the new work to be done in classification schedules and catalogue codes to meet the needs of non-conventional document. Tightens the definition so as to exclude materials and samples of commodities from the connotation of document.

1 EXPERIENCE 1

It was an August evening of 1950 in Washington. A large number of documentalists assembled at the residence of Mrs. Ruth Hooker for dinner. Parthasarathy, myself and a Frenchman were the three non-Americans in the group. A spontaneous chase of "Document" started. The conservatives confined its denotation to a conventional book, periodical, or a portion thereof. The Frenchmen started with the ambitious definition of "any medium for communication"; this led to his accepting a statue as a document and even any exhibit in a museum. Each one tried to talk every other by citing a concrete example believing the definition proposed. That evening gave an exciting experience. Since then I have been chasing the will o' the wisp through a succession of definitions. The closer and more comprehensive the definition reached, the sharper looked the commission and the omission involved, even as clearer the cloth the more arrestingly it shows forth even the tiniest speck of dirt. I thought that I had got the best result in the definition included in my Heading and canons: comparative study of five catalogue codes (Blunt & Sons), published in April, 1955.

11 Beneficent Call

But my self complacence was rudely disturbed at the International Congress of Librarians and Documentalists held in Brussels in September, 1955. It was occasioned by two calls. On 10 September, Dr. Bourgeois asked me to preside over the Ifla's meeting on Audio-visual Materials. This was a problem. For I had had never acquired, organised, or served such materials; nor had I devoted thought to them at any time, or written upon them. The situation recalled to mind an anecdote of 1925. At the time, a member of a Borough Council of England told me, "I am not a learned man, I have been for the first time elected to the Borough Council. There is a convention that each councillor should be assigned at least to one Standing Committee. The high-brow old-guards had themselves put into influential Committees such as those of Finance, Works and Personnel.

---

* Continued from *An lib sc* 2, 1955, 122.

There was some appropriateness in it. For, I have never read books and I therefore have an open mind about books" I had a vacant mind about audio-visual materials. However, I accepted the call of Ifla for the reason that it remembered Asia and felt it expedient to give some place to it in the Congress - important or unimportant. Two days later, FID also asked me to preside over its own meeting on Audio visual Materials. Moreover, according to a principle in life, any invitation without any sinister motive may prove beneficial if accepted and acted upon.

12 Audio Visual Material

These two calls made me spend midnight current in reading the two preliminary reports on Audio Visual Materials. The report to Ifla by N. B. Moore of the Reynolds Audio Visual Department of the Rochester Public Library, U. S. A., was largely a descriptive account of the extent of the use of films in public library service and adult education in U. S. A. It did not in any way disturb my complacence about my latest definition of "Document" Moreover, a more important meeting on Theory of Classification was being held by FID at the same time. I, therefore, formally opened the Ifla meeting and handed it over to the care of the Vice-President, De Passe. But the report to FID by P. Loose of Holland did shock me out agreeably from the mood of self-complacence into which my definition of "Document" had thrown me. For, Loose brought to notice a new kind of material, bound to figure in future increasingly in the documentation work and documentation service expected of documentalists. For., these form a section of the staff of a library or of a library system, or of the library profession charged with the duty of bringing to the notice of an advanced worker, exhaustively and expeditiously, every document - particularly the ones embodying micro thought or experience - with a direct or indirect bearing on the specific topic, usually of tiny extension, on which the worker's mind is turned at the moment. The discussion at the meeting was about to take an unfruitful turn by chasing the definition of "Audio visual material". I averted it by persuading the members to accept a provisional definition by enumeration of the materials Loose had in mind, and to proceed with the special problems of classification, cataloguing, service and maintenance created by them.

13 Experience 2

The new experience gained at this meeting at Brussels Congress has again pressed my mind in the pursuit of a further approximation to a precise definition of "Document" as it is to be understood by documentalists. This paper is thus a result of the impact of the Brussels Congress. I shall begin with the definition given in the Heading and canons. I shall sort out the variety of materials likely to be handled by documentalists into those of the conventional kind and of the non-conventional kinds This will suggest the extensions and the restrictions to be put on the definition. I shall also indicate the new problems created by the non-conventional materials of different sorts in their classification, cataloguing and maintenance

2 Provisional Definition

The following is the route along which the definition of "document" is reached. (1)"Thought-unit" is taken as an assumed term. (2)"Expression thought" is defined as thought-unit expressed pressed in language or symbols or in any other mode, and made thereby communicable. (3) "Work" is used as a briefer synonym for "Expressed thought" (4) "Embodied thought" is defined as record of work on paper or other material, fit for physical handling, transport across space and preservation through time. (5) "Document" is used as a briefer synonym for "Embodied thought". In my Social bibliography"(Blunt and Sons) of 1952, it has been shown that ease of physical handling of document implies a certain optimum weight, durability, size and shape. These factors have, in course of time, made paper the conventional material to record on. Leaf, cloth, silk and vellum had been used in the past.

21 Conventional Kind

Apart from the use of paper, the conventional kind of document has the work recorded on it in the phonetic symbols forming the script of an articulate language with or without illustrations used as a help in the communication of thought. This implies that the thought-content of the document is expressed essentially in an articulate language. Further in the conventional kind of document the recording is done by writing, typing, printing, or by some near-printing process. In the extreme end, a document is an independent physical entity by itself - say a book or a pamphlet. In public library service and academic library service for students, book is the dominant kind of document in use. In business library service and research library service, pamphlet and an article in a periodical or a part of a book is the dominant kind of document in use. These two together will be taken to contribute to "Document of Conventional Kind". The first of these types, viz book, will be called Macro Document; and its thought-content will be called Macro Thought. The second type of document will be called Micro Document; and its thought-content will be called Micro Thought.

22 Fascimilie Reproduction

In recent years and particularly after the two World Wars, scarcity of older books and periodicals still needed for current use - scarcity caused by sheer efflux of time or by war damage - brought into vogue reproduction of them by photographic, chemical and other so-called mechanical processes. At first, the reproduction was more or less of the same size as the original. This type of documents is virtually of the same kind as the original conventional kind.

23 Non-Conventional in Script

A conventional document may be reproduced or recorded in a nonconventional script, such as braille, stenograph and cipher. But the medium of expression is only an articulate language - either a natural one or an artifical one. For purposes of documentation work, this type also may be taken as document of the conventional kind.

24 Map

Map has been in use as a document for a considerable time. It is abnormal in size and shape. But a collection of maps constituting an atlas is often of normal size and shape. On the whole, a map or atlas is usually admitted into the category of document of conventional kind.

25 Micro-Reproduction Non-Conventional

Mechanical reproduction method can be used to reproduce the original document on a considerably reduced scale. The enormous output of the printing press of the world has begun to create an acute problem in stock-room-space. This has led to increasing resort to extremely small-scale reproduction. For example, a book of 100 pages is reproduced on a 3"x5" card. If it is an opaque card, it is called a micro card. Rider's book on it is well-known. If the reproduction is on transparent film, it is called a micro-film or simple a film. Film is either in the form a long roll called film-roll, or in the form of a strip of about 9 inches in length and called film strip. This kind of document does not differ from the conventional kind of document either in the mode of expression or in the script or symbol used in recording. The difference is only in the size, shape, and nature of the material of embodiment. Moreover, it is of recent origin. It may therefore, be called a Non-Conventional Document of the first kind. Miniature books of about an inch in height have been produced occasionally all along to past. They are only bibliographical curios. They are not figuring much in day-to-day service. Nor is the size of the script as small as in a micro-card or a film. We may merely regard them as freaks within the conventional kind. The provisional definition of "Document" admits into itself micro-cards and micro-films. No amendment in definition is called for to include them. To this category of document belongs also the Ceiling Book. This is a book in film-roll served to patients in bed. They project it on to the ceiling and read it while in the lying posture.

3 AUDIO VISUAL RECORD OF WORK : NON-CONVENTIONAL DOCUMENT OF THE SECOND KIND

Any conventional document or non-conventional document of the first kind is essentially dependent on phonetic symbol or script as form of recording, and language as medium for expression of thought. But recent advances in technology have made practicable and more or less cheap, the direct recording of sound vibrations unmediated by script, and the kinematographic recording of expression of thought throught the medium of gestures, and still and moving scenes and histrionic action. They have also made practicable and more or less cheap a synchronised combination of these two kinds of records. These three variaties of record are comprehended by the provisional definition of document. Their comprehension is made possible by the following wide terms occurring in the definition of "Expressed and Embodied thought" - (1) expressed in language or symbols or in any other mode; and (2) recorded on paper or any other material - and by the omission of the term "in phonetic symbol or script" after the word "recorded". Thus we can speak of Audio Document, Visual Document, and Audio Visual Document. These three may be taken as variaties of Non-Conventional Document of the Second Kind.

31 Audio Document

At the early stages, sound recording was largely used only to produce musical records. In recent years, books are being embodied as audio-document for the benefit of the blind. Such documents are now being produced by the libraries of many countries. Even more recently, audio-document is produced also for the benefit of the illiterate; and to help the neoliterate up the path of literacy, speaking book is being attempted, It consists of the printed book with a companion attachment of the sound-record of the words in it. Loose mentions in his Report to FID that since 1954 the California Medical Association has been sponsoring a medical abstracts service in speech recorded on magnetic tape, to obviate the use of eyes for the purpose by busy practitioners. This service is said to cover 600 periodicals in 60-minute recordings. Document in the form of wire record is becoming common. Mahatma Gandhi's historic speeches at prayer meetings are now preserved as audio documents in the National Archives of India. Copies of them can at any time be produced in any quantity. Audio documents are now regularly **served** by libraries.

32 Visual Document

Library service to illiterates has begun to include also visual documents such as pictures, diagrams and histograms. Even literates prefer the use of such visual documents to the conventional ones. Accordingly, these have been all along interspersed at several places in conventional documents. Ancient manuscripts contain a feast of them. Modern progress in the technology and printing of illustrations has high lighted the visual documents of micro thought forming part of books and periodicals. During World War II, the newspapers of Madras made a heavy call on the Madras University Library for such documents. Due to the absence of an analytical bibliography of microvisual documents, we were put to considerable difficulty to meet the demand. The Third and the Fourth Laws of Library Science were ever threatening us of a charge of violation. Still pictures and cinema reels are now becoming forms of visual document lent out by libraries.

33 Audio Visual Document

Since World War II, the use of educational and documentary talking kinema reels has come into vogue. They are naturally proving effective in mass-communication not only to illiterates but also to literates. This variety of non-conventional document of the second kind was first lent out by special agencies often on rental basis. But libraries are now beginning to handle them in the same way as conventional documents, both for consultation within premises and for free loan for use outside the library. This variety of document is particularly effective in the instruction of technicians, working largely with hand, having little chance to habituate themselves to the use of conventional printed documents, and above all often too tired physically to **sit** up and pore through closely printed matter. Even in advanced university classes, their use has become part of routine teaching technique. Their use saves time and produces a more realistic impression than the conventional teaching technique of the earlier generation. I had opportunity to appreciate the superiority of the variety of document in the communication of specific information, when I happened to visit factories in recent months in excursion arranged by library conferences. It has an important role in productivity drive. We should no longer regard audio visual document to have only entertainment or relaxation value, even as public library service was regarded during the last century. It is an important tool for the enrichment of memory and the sharpening of intellect. It is now available both as **macro** document and as micro document.

4 INSTRUMENT-RECORD OF PHENOMENA : NON-CONVENTIONAL DOCUMENT OF THE THIRD KIND

The chief contribution of Loose's Report to the Brussels Congress was in its putting the library profession on the alert in regard to another kind of "audio visual material" coming into library collection. It is a material that deviates from the conventional document, not merely in the symbol **or** the mode of recording and in physical embodiment of the record, but also in what is recorded. A non-conventional document of the first and the second kinds is like a conventional document in that it is a record of thought created and expressed by human mind. This new audio visual material is not recording human **thought** at all. It is a record of phenomena, made directly, unmediated by the human mind and before they get transformed into thought and even before they get into the human mind. Instrument technology, photography, radar, and various other elements have made such instrument-record of natural and social phenomena possible.

41 Value of Instrument-Record

One reason for the increasing importance of instrument-record of that kind is that it gives a permanent record on a solid material, of an ephemeral or transient or momentary phenomenon from the bondage of the subjective element of the observer and of the need of the student of it being present and on the alert at the time and place of the occurrence of the phenomenon. No other form of record is equally untainted by the idiosyncracy of the observer. No doubt the instrument itself and the process of recording may add taints of their own. But these are more measureable and capable of being brought under control than the subjective taint of the observer.

42 Extension of Primary Senses

The recording instrument can be attached to other instruments and apparatus, which are extension of the primary senses. The record made by such an instrument brings the phenomenon within the range of the happenings in the distant heavenly bodies is made available for study. Similarly, microscopic bacteria and ultramicroscopic virus **are** magnified and recorded in a scale which is within the range of the eye. The seismic **tremor** in the unreachable parts of the earth gets recorded. Invisible objects up in the distant regions of the sky and down in the depths of the sea are made by the radar to leave their record permanently on a material that can be easily **handled,** transported and preserved. The pursuit of astronomy, physics, chemistry, biology, ecology, behaviourism, and sociology is facilitated by such records. Micro-cinematograph produces even more helpful records, which make the study of changes in the structure of materials, ontogeny of cells, **and faults** in the moving parts of machinery, capable of being pursued with profit, **at a pace which is comfortable to the mind.**

43 Extension of the Definition of Document

The kind of records mentioned above are in increasing use. They should be taken into the category of document, figuring in documentation work and documentation service organised to help specialists in their work. **A record of** this kind may be called "Non-Conventional Document of the Third Kind". To make this possible, the definition of "Document" should be extended so as to read as follows:-

Document:-Record-made on more or less flat surface or on surface admitting of being spread flat when required, made of paper or other material, fit for easy handling, transport **across** space and preservation through **time - of thought created by mind and expressed in language or symbols or in any other mode, and/or of natural or social phenomena made directly by instrument without being passed through human mind and woven into thought created and expressed by it.**

44 Exclusion of Categories

In the meetings at the Brussels Congress, devoted to non-conventional documents devoted by the term 'audio visual material', it was difficult, as already stated, to prevent discussion wandering too wide of the mark. This is unavoidable in a group of thinking minds, unless the universe of discussion is provisionally defined and its boundary is extended, if need be, at later stages only conscientiously and in defined terms. The discussion in the Committee on Cataloguing was prevented from being fruitful because of failure to define the basic terms and concepts, and even of uncritical, escapist resistance to work on them. Some of the categories excluded by the above definition may be mentioned. Radio and television was brought into the discussion. **These** are no doubt means of audio visual communication. But they are not documents; becasue they are not records on materials fit for handling or preservation. Statues, pieces of china, and the material exhibits in a museum were mentioned because they convey thought expressed in some way. But none of these is a document, since it is not a record on a more less flat surface. "Books in running brooks" can be admitted as a poetic expression or as a piece of rhetoric; it implies, no doubt, symbol expressing and communicating thought. But it does not answer the definition of "Document", as it figures in library service either to a general reader or to a specialist.

45 Refractory Materials

There are refractive materials in the border line, baffling any definition. One type incorporates flat samples of materials or mounted material built together in the forms of a book. If it contains no record other than descriptive labels for the samples, we may decline to accept it **as a document. But the letter**-press may be more than lables. It may give additional information of a historical or technical nature. This letter-press area may be considerable. Then, it is easy to accept it as a document. But, if the **letter**-press area is slight or small, the decision is difficult. The Madras University Library was hard put to decide this issue, when it collected a set of volumes discarded by the **Connemera** Public Library about 25 years ago. It was one of 50 or 60 sets of volumes on textiles produced by the East India Company to help the Lancashire weavers to copy the **pattern and texture of cloth** produced in India. The small amount of letter-press gave valuable historical information about the high quality of Dacca muslin produced in Pre-British India but suppressed and even wiped out both by governmental action and tariff policy. If the textiles were illustrated by pictures, there would have been no hesitation in declaring the set as a document. But the set consisted mostly of actual samples of cloth mounted on paper, with descriptive and historical information amounting to more than a mere label. There will arise many other kinds of refractive cases exceeding the capacity of any tight definition and needing ad hoc decision.

5 CLASSIFICATION

We shall next examine the special problems in classification peculiar to different kinds of document. From the present point of view, classification is the designing of a system of ordinal numbers, such that each document can be represented by a unique ordinal number with the aid of which documents can be arranged in a preferred, more or less helpful, sequence and the restoration on the sequence can be mechanised without the need to examine each document in detail. The unique ordinal number representing a document is its Call Number. It consists of three parts - class number, document number, and collection number.

Class Number represents the thought-content of the document - its soul, so to speak it is desirable that it should be co-extensive with the thought-content, so that no two related subjects **differing** essentially in their extension get the same class number; it is also desirable that the class number should be expressive of all the relevant characteristics of the subject in the true measure of their exact incidence.

The function of Document Number is to individualise the several documents with the same class number - i. e. embodying and expressing more or less similar thought-content; leaving out for the moment complications such as those of multi-volumed or dependent documents, a document number consists of three facets. Language facet, Form facet, and Year or Author **facets**. If the medium is a natural language, its number forms the first facet and the literary form of exposition forms the second facet. For economy, the language facet and the form facet are by convention omitted if the language is the favoured language of the library and the form of exposition is prose. When the medium is not language, the form facet represents the medium of expression, such as picture, graphs, diagram, map etc.

The Collection Number represents the physical form of embodiment, in the case of all kinds of non-conventional documents. Their abnormal physical form prevents their being housed and arranged as a single collection along with books. Each variety of document has to be housed and arranged as a separate collection in receptacles peculiar to each variety. Thus all varieties of documents having the same class number and the first **two** of the facets mentioned for document number will not be found in the same collection. The function of the Collection Number is to indicate the collection in which the document is located.

51 Class Number

Much work has been done on class number. Most schemes of classification provide class numbers adequately for the needs of macro documents. But few are now capable of doing so for micro documents; and yet the emphasis of documentation is on micro documents. Existing schemes are too superficial for this purpose. They demand Depth Classification, capable of handling subjects with many facets. UDC was the first scheme to attempt it. In some measure, it provided for analysis in the idea plane and synthesis in the notational plane. It was thus **conceived** more or less as an analytico-synthetic scheme. But its adoption of the rigid, enumerative DC as **core** is standing in the way of achieving the maximum advantages of an analytico-synthetic scheme. CC based itself, from the very start, on facet analysis. It is therefore more versatile in facing the needs of the depth classification. The postulates of Five Fundamental Categories, **Rounds, Levels among** facets, and zones in arrays are easily implemented in CC. This adds to its versatility. But as depth increases, the difficulties increase in regard to rounds and levels. The Brussels Congress showed great sensitiveness to these difficulties. It sought to strengthen the hands of the FID/CA, the Committee on General Theory of Classification. The proposed International Seminar and Fellowship on the subject will be able to overcome the difficulties by world-wide team work, or at any rate set the pace for it. The well-financed work in progress on rapid mechanical selectors is causing confusion and inducing the complascence of escapism in a section of documentalists. It should be remembered that the machine can make selection rapid, only in the measure in which classification has fulfilled its part in facet-analysis in the enumeration of sharp enough isolates in the schedule for each facet, and in the methodology to analyse a document into its facets and to fix the isolate number in each of the facets. To some extent, the machine may help us to bypass the exact determination of the sequence of facets beyond a certain depth. But all the other work of classification should be completed efficiently, before the isolate numbers can be translated into the binary code needed for the machine to do its job rapidly. Classification cannot therefore rest on its oars, if the library profession is to play its part in documentation and **fulfil** its role in the team work of humanity to advance research, increase production, improve distribution of wealth, commodities, and services, **help establishing international peace and contribute to world-welfare.**

52 Documentation Number

Sufficient attention has not been paid by UDC to the Form Facet of Documentation Number. It mixes up some of the isolates of this facet and the isolates of collection number and some others in one and the same schedule. CC is the only scheme providing a separate schedule for the form facet of documentation number, in a conscious way. But its schedule needs considerable enrichment to deal with all the all the varieties of document with non-linguistic media for expression. Hardly anything has been done in regard to the symbols of expression occurring or likely to occur in non-conventional documents of the third kind. The discussion on Loose's Report at the Brussels Congress high-lighted this lacuna. However, it is doubtful if all the isolates suggested by him would be valid - say, three-dimensional representation, objects, specimens - occurring on page 201 of volume 1 of the International Congress of Libraries and Documentalists, Brussels, 1955. They may be needed in arranging exhibits in a museum, but not in documentation.

53 Collection Number

No scheme has provided schedule for collection number. Ranganathan's Library administration (1935) and Library Manual (1951) indicate or demonstrate their use and the construction in a **feeble** way. But it is far from adequate. The construction of a satisfactory schedule, satisfying the canons of classifications is not difficult. It must be done. This is a small project, which FID may very well take up and complete in a short time, as it is concerned only with the physique of a document. It can even be done by any single national member of FID The technical sub committee on classification, appointed as a Standing Committee of the Insdoc in India can easily take up this work and complete it soon.

6 CATALOGUING

Part 0 of Ranganathan's "Theory of **library** catalogue" (1938) and of his "Library catalogue: Fundamentals and procedure" (1949) has made a systematic study of the possible sections in the main entry of a conventional document. It has shown that all the varieties of even a conventional document do not call for equal details of information to be given in the main entry. The minimum information needed in any documentation list consists of what is prescribed for the Leading Section (call number), Heading (Author statement or its equivalent), Title Section (statement of title, collaborators and edition), and Note (statement of series of related books). This minimum is sufficient in the entry in a library catalogue, pertaining to a modern printed book (printed after 1550 in Europe or in corresponding later periods elsewhere), without any unusual physical peculiarity. But this is not sufficient even for such an ultra-conventional modern document in a **National** Bibliography or trade-list. There is need to add another section giving format, collection and imprint. Again even in a library catalogue, the main entry of **an** incunabulum, a map, a musical score, a book transliterating the words of a language in a foreign script or in short hand etc. and a book **of abnormal size, will have to** give additional information. Elaborate cataloguing rules for the additional sections for incunabalum, map, and music are already coded by the library of Congress along modern lines in its "Rules for descriptive cataloguing" in the **Library of Congress** (adopted by the American Library Association) 1949. An additional note will be necessary to indicate transliteration in a foreign script. Ranganathan's "Classified catalogue **code**" prescribed indication of abnormal size by the underlining, overlining etc of document number. A micro document will need a separate section showing its location in its **host** document. The ISO/TC46 is establishing some standard rules on this matter. The different kinds of non-conventional document need special rules prescribing standards of description to be put in extra sections in the main entry.

61 Non-Conventional Document of First Kind

The main entry of a micro copy of a conventional document should reproduce all the four sections of the main entry of the original. But this is not sufficient. There should be an additional section describing the physique of the micro copy. This section may have to mention the reduction scale, the **number of micro cards or** film strips or the length of the film roll into which the original document extends, and perhaps the magnifying power and other qualities of the reading apparatus needed. The standard technical terms and a code of rules for formulating this new section are to be established The **Library of Congress has gone forward in** this work. The time will soon come to have an international standard.

62 Non-Conventional Document of Second Kind

Audio-visual materials form an altogether new kind of document. Except in the case of a "Speaking book" made of a sound record of a document of the conventional kind, this class of document has no filiation to the current catalogue codes. Perhaps, we may follow their analogy. The leading section of the main entry should consist of the call number. The heading may have to consist of the name of the "Speaker" in the case of a sound record. It may have to be the name of the author of the theme in the case of a cinema film. The title section in the main entry of the latter may have to include in the collaborator statement, the names of new kinds of collaborators such as kinematographer, sound-recorder, director of music, general director and the various art-specialists. The title-statement itself will have to follow the name given to the film by the maker or the author of it. In the place of the section giving format, collection and imprint, there should be a section giving perhaps the width of the reel, the length of the reel in feet, the speed to be used in unwinding, the duration of show, the colour factor, the quality of having two dimensional effect or three dimensional effect, the sound factor, and relation to any published book if any. A full fledged cataloguing code covering all these and other relevant details is yet to be drafted. It will be an advantage, if ISO/TC 46 can take the initiative to prevent the avoidable difficulties experienced in relation to books, on account of the casual and irrational way in which the make up of the title page had been allowed to evolve. It is only now after four centuries of drifting that India's proposal contained in chapter 7 of Ranganathan's "Heading and canons" (1955) and being formulated as a draft standard by the Indian Standards Institution has begun to receive attention in the form of a resolution passed by the Brussels Congress of September last asking for a standard to be established for the preliminary pages of a book, so as to enable a catalogue code to anchor itself on the title-page and its overflow into its back and later-pages if necessary and to assume the unrestricted play and service of the Canon of Ascertainability formulated in Section 331 of the "Heading and canons". ISO/TC 46 may even now promote a standard for the audio-visual materials of any variety carrying within itself some section corresponding to the title-page and the other preliminary pages of a book, giving all the data needed for descriptive cataloguing. Such a prompt action at the international level will eliminate wastage of thought-energy in beating about the bush both in framing catalogue codes and in cataloguing audio-visual materials.

63 Non-conventional Document of Third Kind

An instrument-record, unmediated by human mind, is seldom an independent document, even as the manuscript of type-script of a book is seldom circulated as part of library material. But copies of it are often made as micro documents forming part of a macro document. By its very nature, it embodies only micro experience of long-extension. But it is of vital importance in the creation of new thought. The instrument record of the total solar eclipse of the first decade of the present century has made history in physics. The electron-microscope record of virus has narrowed the gulf between the most complicated molecule of protoplasm and the living of organism of the most primitive kind known so far. Every subject is progressing by leaps and bounds with the aid of such auto-records — astrophysics, organic chemistry, technology, medicine, psychology and sociology. It is, therefore, an imperative duty of the library profession to make documentation lists of such auto-records. It may be difficult to get an author heading for such a document. Nor will it easily admit of a crisp "title" fit to be used as heading for main entry. Perhaps, the best course will be to make the subject entry the main entry even if the rules for a dictionary catalogue are followed. For this we have precedence in Rule 121 of Cutter's "Rules for a dictionary catalogue". In a classified catalogue and in a dictionary catalogue making the subject entry the main entry, an improvised title will have to be used in most case. There is therefore need to frame special rules for improvising the body of the entry for an auto-record.

64 Analytical Entry

In the case of an important auto-record, there may be simultaneous demand for copies from several patrons of one and the same library. This will be specially so in a college or **university** library, when the students of a class are turned on them. This phenomenon is not however new. In the Delhi University **Library** for example, at a time when the Dean of the Faculty of Law **is** particular that students should individually look up reported case, several students would compete to get priority. This pressure could be met to some extent by making analytical entries for a reported case from every possible publication containing the report. In a similar way, the location of an auto-record of topical interest in as many publications as possible – books as well as periodicals – should be indicated by analytical entries.

65 International Service

But such an intensive analytical documentation by each library will entail much cost. A more economical method will be to get such a documentation list to be produced by a central documentation agency of regional, national or international **status**. For current or **nascent** auto-records, the time-lag will make international agency ineffective. A national or a regional agency may be preferable. But, in the case of a retrospective bibliography of auto-records, an international agency will be more economical and practicable.

66 Illustration drawn by Hand

Before auto-records got established as result of recent advances in the technology concerned **the only** recourse for impersonal source materials equivalent to auto-records was to make a faithful drawing of what was observed. **Indeed** a good scientist - particularly a biologist - was often an expert in graphic art. Even now, a student of any biological science has to be good at drawing. Such drawings of pre-auto-record days also stand in need of retrospective bibliography. In this connection, I remember an experience of 1925. I **went** to visit the newly erected library building of the then University **College at Reading**. **As the li**brarian was taking me round, an elderly professor joined us. He asked my opinion about the design of the building. Being **an** impetuous youth, I condemned it without reserve. The librarian told me later that that Professor was himself responsible for that design. This made me repentent. When I went to have lunch with the members of the Faculty, I apologised to the professor for my blunt statement. But the professor was a true scientist. He invited me to his house to know about the defects in the building. This gave me a unique experience in regard to the arduous way in which a professor in a progressive country worked. The professor - I think Cole was his name - was engaged in writing a history of anatomy. He had made a fairly exhaustive collection of printed and manuscript books on anatomy. He had analysed each of these books and periodicals and prepared an exhaustive micro documentation list in 5" x 3" cards. This included an exhaustive bibliography of all the anatomical drawings. The professor told me that a comparison of the drawings of the **horse**, for example, clearly showed that they were all copies of a single original. He said that the location of so many copies in his collection made it easy to make all his students study them simultaneously.

7 REFERENCE SERVICE AND CIRCULATION

Open access is obviously impossible in the case of all the three kinds of non-conventional documents. It cannot serve much purpose, as one cannot browse into their contents as in the case of a conventional book. Therefore, reference service cannot be done with the documents concerned spread open before the reader. The slow and systematic approximation of the right document cannot be made as in the case of conventional books. This will put extra strain on the reference librarian. He should have a more intimate knowledge of the contents of a non-conventional document than of a conventional one.

Circulation work also calls for extra action. **A non-conventional document cannot be lent** out in a bare state. It is necessary to put it in a special receptacle and then hand it over . Inspite of providing such a special receptacle, the libraries find that gramaphone records come back, for example, with harmful scratches. In fact, the circulation staff should give **special** instructions to borrowers about the handling of such a document and the kind of apparatus that should be employed in using it. It is indeed desirable that a document of that kind should have a set of printed or written instructions attached to it, when it is lent out in circulation or for **consultation within the premises**.

8 MAINTENANCE

Special containers are necessary to maintain the non-conventional documents of different kinds. This is but natural. In the days of the clay tablets of Assyria and the scrolls of later days, the **urn or a cylindrical box was** needed. In the case of oversized manuscripts of the **mediaeval age**, too heavy to be carried about, chaining to the shelves was necessary. Indeed the size and form of the document determines the receptacle needed. The task of protection from injury also varies with the material base, its strength, durability and frequency of use. For example, I saw in Hyderabad that the less frequently used manuscripts are protected from insects by the insertion of a snake-skin inside the book and being wrapped up in a silk-cloth. A modern book is protected from insects by allowing the readers to have open access. No doubt open access causes more wear and tear and shortens the life of a book. But it is known that the thought-content of an ordinary modern book is outmoded by the time it gets worn out by legitimate use. It is too early to know, all the ills to which the physique of non-conventional documents are prone and to devise satisfactory methods for their maintenance. We do not yet know the number of years within which they may have to be discarded. Future alone will make us wise in these matters.

CALCUTTA
CENTRAL LIBRARY
UNIVE

DEPTH CLASSIFICATION *

19 CLASSIFICATION OF MANAGEMENT

S. R. RANGANATHAN

Traces the history of the emergence of literary warrant in Management, its lateness, and its starting with the applied field. Points out the puzzle due to failure to recognise the recurrence of each branch of management as a focus inside the energy facet of every other branch of it. Discusses the analysis in the idea plane into rounds, levels, facets, and arrays of each of the branches. Demonstrates the confusion due to chaos in the verbal plane. Studies the organisation of the notational plane and the use of the last three zones of the different arrays, so as to use the full versatility of the notational system. Gives, with notes, a first draft of the schedules for the diverse facets as they would be in Colon Classification, inviting suggestions for improvement, and for the use of the synthesised CC numbers in the construction of enumerative schedule for other schemes such as UDC.

1 INTRODUCTION

Depth classification of micro documents on management bristles with many difficulties -- as many as in any other subject. But unlike in other subjects of the conventional kind, even the macro documents on management -- such as books and whole periodicals -- create difficult problems. 651, 652, and 657 of DC and UDC as well as V:8, W:8, and X:8 of CC often fail to satisfy the Canons of Helpfulness and Relativity, when used for macro documents. Clumsy numbers result in the case of micro documents. This unpreparedness of the schemes to receive and accommodate management-documents in helpful places has been due to the absence of literary warrant in the past. Its intensity has begun to reach some magnitude only during the last one or two decades. This does not mean that management itself is as new as this.

11 Management-in-Action

Management-in-action has been in existence ever since man came into existence. For example, the Srauta-sutra literature (literature on Vedic rituals) reveals meticulous details in regard to location, lay-out, flow of work, personnel, and organisation as a whole. In fact all through time, management has always been in action. Only, it has been taken as a natural skill. When the magnitude of an enterprise increased, management met the situation by the method of trial and error. There was no conscious and concerted pursuit of the foundations or the superstructure of management as a science. With the advent of the industrial revolution, management of industrial enterprises assumed enormous dimensions. Even then, during the first century, the expansive exploiting economy of the few wakeful countries, made possible by vast colonial regions in the resting phase of their culture, allowed the art of management to depend solely on the flair of exceptional men and allowed also wasteful techniques in the management-in-action. However, the archives of the manufacturing and commercial houses of the nineteenth century show how, though guided by sheer instinct, management-in-action was moving along more or less helpful lines.

Continued from *An lib sc* 3, 1956, 10

12 Precipitation of Literature

Literary warrant for the classification of management took shape only at the turn of the twentieth century. By common consent, the first classic to turn attention to management as a discipline to be pursued along scientific lines is taken to be F W Taylor's *Principles and methods of scientific management* (1911). Taylor started at the lowest level of industrial hierarchy, the single worker at the lathe. He began with the simple problem of co-ordinating the man and the tool with maximal efficiency. He ultimately covered all the factors affecting, however remotely, the worker's capacity to give his best, and the efficiency of the enterprise as a whole. The second classic on the subject is taken to be H Fayol's *Industrial and general administration -- forecasting, planning, organisation, command, control* (French ed 1925 and Eng ed 1929). Fayol started at the topmost level of industrial hierarchy, the general manager. He ultimately covered all the lower grades. The ever-lasting play of the cycle of scientific method on management was emphasised by Mary P Follett in a series of papers presented between 1924 and 1933 and later brought out by H C Metcalf and L Urwick as *Dynamic administration* (1945). These three classics touched off a precipitation of management literature, now challenging classification. There are already a few hundred volumes covering the whole field or some sections of it. Articles are appearing continuously in engineering and technological periodicals. There are also a score of periodicals exclusively devoted either to management as a whole or to some facet or other of it. The annual output of micro thought has justified the establishment of an abstracting periodical such as the *Management abstracts* (1947 --).

13 Formation of Profession

Management has been all along one of the functions of the chief of an enterprise or an institution. He alone knew all the threads -- be they material, monetary, or human -- and the objective towards which they were all to be co-ordinated and used. In exercising this function of management, the chief was guided solely by his superior flair. Location, lay-out, fixtures, fittings, furniture, design and control of the flow of work, quality control, testing and releasing the product or the service, all the problem of personnel, finding the finance, keeping the account, and the organisation in general were guided only by flair. But flair can go only a small way. Its limitation came to surface gradually with the increase in the size of the enterprise or institution. The complacence of dependence on flair was rudely shaken in a competetive enterprise supplying commodities and material services admitting of immediate assessment. The hazard became high. Success or ruin became the only two alternatives; and these were immediate and visible. To minimise the chance for ruin, manag ment had to be guided by definite basic normative principles. Flair had to give way largely to conscious intellectual methodology and measurement. It had to be recognised as a profession for which a person can be and should be educated as for any technical profession. Naturally factories were the first to see the inevitability of this. It has already fully establishe itself in USA. In an interview reported in the *Times of India* (8 Feb, 1956), Charles H Percy said that there was hardly a single company - out of the 1,510 companies on the New York Stock Exchange -- whose management was not vested in a professional manager. Internation competition is fast forcing this practice on all other countries. Another index of the firm fo mation of the profession of management is the present-day possibility of Consultant-in-Mana ment as a career. A still another index of th individuality and virility of the profession is the formation of several Management Associations with the International Management Congress (1924 --) at the apex. An implication of all this is a continuous increase in new thought on the diverse facets of management; and this throws a challenge to classification.

14 Spread of the Profession

It is true that the new profession of ma gement found its first locus within the sphere the industrial world engaged in the production and distribution of commodities and services, at a high level of quality and a low level of co From this restricted sphere the profession been steadily spreading itself into other sphe One of the earliest additional spheres to be e tered was that of Local Authorities. The bri acilitating this was perhaps the municipalisa-ion of public utilities. The formation of the nstitute of Public Administration is evidence f the recognition of the new profession in this phere. The spread of the profession into the phere of National and International Government vas initiated in 1937 by the *Report* of the Presi-lent's Committee on Administrative Management, ransmitted to the Congress by F D Roosevelt vith the endorsement, " A government without ood management is a house builded on sand". he bridge facilitating the entry into the sphere government was again perhaps the nationali-ation of the production and distribution of many ommodities and services, lying outside the onventional functions of a government. When oosevelt was first elected President in 1932, iere were about 10 Government Corporations - that is Public Authorities in the form of ompanies. By 1936, this number rose to 93. n his election for a second term, he sensed e bewilderment caused by so many state en-erprises and realised the need for the grand nterprise of government itself to take help rom the new profession of management. Now lmost every government is getting converted this view, that the management *per se* of a overnment, as distinct from its political make-p and changing ideologies, should be regarded s an impersonal objective technique. The ewly awakened India too is endeavouring to ut this in practice. The tradition that the ndian Civil Service was the best in the world as for long delaying the process The first ult of it to be recognised was that it was in ivory tower too rigid to allow the intensions the legislature and the executive to reach the iblic. It is therefore insisted that the men in e present Indian Administrative Service should me into closer contact with the public. The esult tends to be for the I A S men to outdo ven the Ministers in overspending their time making speeches and encroaching too much to the area of expounding ideology and pro-uncing general policy. This intensifies the acuum in the management sector to government he task of national reconstruction is not by any eans helped by this. What is needed is to plant od management within the machinery of govern-ent and to stimulate the civil service personnel place greater emphasis on managerial virtues opposed to demagoguish and political ones. ere, the Central Secretariate Library has a finite part to play. It should render aggressive and exhaustive documentation service in management, through periodical anticipatory documentation lists. This needs a helpful classification technique applicable to management.

15 Applied vs Pure Management

Applied management was seized by library classification much earlier than pure management. In this, management differs from the traditional subjects, such as mathematics, physics, chemistry, botany, zoology, psychology, and economics. In these subjects, literary warrant had established itself with equal intensity in the pure as well as the applied fields, before library classification was established as a systematic discipline and was turned on those subjects. But management acquired literary warrant only in recent years. Even then, it was only in the applied field. The pure field is still virtually fallow. Therefore, the arrangement of documents and their entries, with any managerial content, goes with the different conventional main classes forming the field of application. We find them distributed among library science, hospitals and other institutions, education, constitutional history, political science, and the diverse industries and commerce in the main class economics. The subdivision of management within a particular host class has been affected by the development within the host class concerned. Poverty of literary warrant in pure management has been responsible for the delay in management being given a place of its own among the main classes of any scheme of classification. This has, in its turn, led to delay in the study of the fundamental facet analysis specific to management *per se*. We seem to be now entering the stage when this facet analysis and the building of the associated schedules should be done and these should be carried over to any host class in the measure of its requirement. Even if literary warrant has not established itself for a separate main class, we have begun to see the advantage of establishing facets and schedules for pure management and carrying them over to various fields of application. This means that the branches of pure management should be traced out with the aid of the published literature in the applied field.

2 DEVELOPMENT OF BRANCHES

A main class is like a banyan tree. There is a main trunk -- the basic class -- with its roots. There are also branches -- foci in facets of various kinds -- each with its own aerial root reaching down to earth, and forming a subsidiary trunk of its own. In the conventional main classes, the main trunk and the subsidiary trunks are already recognised and classification sees them as an integrated whole. And it is possible to start with the main class as the universe and travel through and work out the proliferations in the various facets. But the process is reversed in the case of a newly emerging main class like management. The branches are seen earlier than the tree itself. The subsidiary trunks had lent themselves for study before the main trunk itself. Let us then have a brief look at the evolution of literature in the several branches, which are to be integrated as branches of the main trunk of management.

21 Finance

Management is essentially the art of securing maximal efficiency in an enterprise. Therefore, the first branch of management to attract literature was that of the measurement of efficiency. The common denominator used as an instrument for measuring efficiency in most of the enterprises is money.

211 Book-keeping and Accountancy

Accordingly, the earliest of the literature now being integrated as part of managerial literature was on Book-Keeping and Accountancy By common consent, the first printed book on book-keeping is taken to be L Paciolo's book of 1494. Since then, there has been a steady stream of books on the subject. Book-keeping culminates in a balance sheet and profit and loss statement, prepared once in a year or at other intervals. This serves only as a retrospective measure of efficiency. In this phase of culmination, we may say that book-keeping transitions into accountancy.

212 Budget and Budgetary Control

Mere book-keeping and accountancy can only show the failure or the success of an enterprise. A more useful measure of efficiency would be to compare actuality with a plan or the intention. The financial dress of the plan or intention is the Budget. Budget may be regarded as postulated prospective accounts. A considerable quantity of literature has grown o
budget. It will certainly be an advantage to ha
the estimates and actuals compared at shorte
intervals than the full budget period. Then the trend of affairs can be seen when there is still time to apply any correction that may be neede
Such a combined use of accounts and budget is called Budgetary Control.

213 Cost Accounting and Cost Control

Budget control can deal only with big groups of income and expenditure. The inefficiency in one element of the group may be balanced and hidden by over-efficiency in ano
This will be incident particularly in factory er
terprises. As early as 1832, Charles Babbag
wrote in his *Economy of machinery and manufactures*, "It is of great importance to know tl
precise expenses of every process as well as the wear and tear of machinery which is due t
it". A book on accountancy implementing thi
idea was the *Factory accounts* (1887) of Garck
and Falls. One of these was an accountant; a
the other an engineer. This fact is significan
This branch of accountancy is called Cost Acc
ting. This is a systematic analysis and prese
tion of the expenditure in each unit of product
or service. The elements into which the anal
should be carried out should include the quant
and cost of the raw materials consumed, the
taken and the wages paid to each operation,
an appropriate share of the Overhead Cost of items common to all the products, such as re
and taxes, insurance, depreciation, repairs
maintenance, generation and distribution of power, internal transport, telephone, station
salary and wages in departments other than t
of actual production or service, canteen, and
on. Cost account should assemble all such c
elements and arrive at the total cost of a product or any component of it, and of a process
any operation forming part of it. Cost Contr
is similar to budgetary control. Correspond
to the over-all budget postulated in advance,
standard is postulated in advance for the vari
elements of costing, such as materials and ti
of operation and wages. The actuals are cor

d to the standards at proper intervals or stages,
en there is still time to apply any correction
at may be needed. Such a combined use of
ost accounts and standards is called Cost Con-
ol. Obviously, the service of the engineering
ction is necessary both to get the standards
materials and time to be established and to
aintain the records of the materials actually
nsumed and the time actually taken on each
eration, process, product or constituent.
st accounting is obviously applicable in all
ctory enterprises, and some service enter-
ises. It is now being extended also to com-
ercial enterprises. It is still a moot question
it can be applied in equal measure to public
ministration, and various professional ser-
ces such as education, library, and medicine,
rgely made of intellectual and creative work.
is so in regard to top-management too.

214 Audit

There has all along been audit as a cor-
late to accountancy. It is concerned with
e correctness, honesty, and legality of finan-
al transactions. It is usually done by an
ency independent of the enterprise. Modern
come-tax laws virtually impose outside audit
all private enterprises. From very ancient
nes, audit has been regarded as a necessary
ntrol over public finance. There is now an
preciable literary warrant in this correlate
accountancy.

215 Management Accountancy

Budget requires to be geared to clearly
tablished and definite policies. It has further
be related to a well-founded and definite orga-
sational structure. These are not matters
thin the scope of the accountant's work. They
definitely within the jurisdiction of the top-
anagement. Every one within the enterprise
s to know the part of the total budget for which
is responsible. He should put up his divi-
nal or departmental budget as the case may
, in the light of the policy laid down by the
-management. The accountant's part is in
e co-ordination of these elemental budgets,
the light of the final decision of the top-mana-
ment on them. Thus the substance and the
ul of budget-making form an essential part
of the work of the top-management. For this reason, it is usual to speak of budget and budgetary control as constituting Management Accountancy. Similarly, the setting up of standards for materials, time, and the man-power needed for use along with cost accounts in the exercise of cost control forms an essential part of top-management. It is, therefore, usual to speak of standard-setting and cost control also as constituting Management Accountancy. Marginal costing is another constituent of Management Accountancy. It includes items such as break-even-analysis and profit-structure.

216 Finance and Financial Control

Literary warrant is gaining in strength in the field of financial planning or capital structure. The study of this starts where accountancy leaves -- that is from the balance sheet and the profit and loss account. It is concerned with topics like total capital, net worth, fixed capital and its investment, circulating capital and its flow, and the raising of funds. It deals with the checks and controls, and the charts and other mechanical aids, needed or helpful in watching the financial position continuously and applying correctives promptly whenever found necessary.

22 Production

The second branch of management to gain literary warrant was Production in an industrial enterprise. It was its secondary trunk that invited attention to the main trunk of management. Though this branch began to take shape in action from the beginning of the nineteenth century as a result of large scale factories coming into existence, its literary warrant is usually taken to have begun with Taylor. This branch of management is concerned with increasing the efficiency of production methods. Efficiency in this area of large scale industrial enterprise calls for great alertness in responding to the accelerating tempo of scientific inventions and discoveries. Fortunately machinery in itself imposes a mental attitude and discipline, favourable to the objective cultivation of the production branch of scientific management. The result is increasing literary warrant and proliferation into sub-branches, each with considerable literary warrant of its own. Taylor himself showed the way of increasing efficiency by attention to the material factors in production, such as lay-out, flow of materials, sequence of operations, interpolation of rest, speed, cut etc. His associate, F B Gilbreth, initiated literary warrant on the process of work, involving investigations, such as motion-study, time-study, and finding "the one best way to do work", as his wife put it. We shall now indicate the several sub-branches of the production branch. The greatest number of sub-branches is found among iron and steel, and other engineering industries. We shall therefore sketch the sub-branches in that area. Suitable elimination and modification will be easy in other areas, including production of services. Generic name such as Production Management, Industrial Engineering and Chemical Engineering is used to denote the sub-branches collectively.

221 Production Engineering

The preliminary step for any production should be designing, including experimental and development work, specification, drawing and estimating quantities. These are technical and non-managerial in scope and content. Production Engineering begins with the technical data and information furnished by the Design Department. It includes activities such as the following:-

1 Analysis of the assembly into sub-assemblies, each sub-assembly into its components and so on till the ultimate units are reached;
2 Specifying the quantity and quality of the materials needed for each unit;
3 Laying the standard of quality for each unit with limits of tolerance;
4 Specifying the procedure for each operation on each unit;
5 Specifying the extent to which each unit should be tooled, by balancing a low tool cost and high labour cost against the reverse of it;
6 Specifying the tools, jigs, and fixtures needed;
7 Specifying the scrap permissible at each operation;
8 Fixing the time for each operation on each unit and each stage of assembly;
9 Specifying the sequence of the operations;
10 Statement of the new machines, tools, and gauges required;
11 Fixing the machine load and output or the unit of work per hour capable of being handled by each machine or process;
12 Recommendation for the purchase of items from outside or specialist firms, where the load on the home plant is too great, or the necessary equipment cannot be provided, or the necessary experience is lacking;
13 Ensuring that the raw material, finished components, and completed products are neither in short supply nor in excess of demand; and
14 Fixing the time table for the commencement and completion of each unit or each operation and for final assembly and release of the product.

Sometimes the items 9 to 14 are collectively labelled Production Planning. Production Engineering may also have administrative charge of Design and Development.

222 Production Control

Production engineering only sets the step for securing efficiency. To secure the intended efficiency, it is necessary to record the actualities and compare them continuously with the specifications and the programmes, so that the necessary correctives may be applied at the proper time. This is called Production Control. It includes activities such as the following:-

1 Control of materials movement within the factory;
2 Control of tools in regard to their design and issue to the shops;
3 Control of due dates as prescribed by the production engineer;
4 Control of quantity and quality at prescribed stages of production;
5 Control of replacement of the material or product rejected by the inspector;
6 Control of efficiency of operations on each unit in respect of the time specified and actually taken.

Sometimes the items 3 to 6 are collectively called Progress Control.

223 Simplification and Standard

The schedules and specifications to be determined by the production engineer will have to be based on the concrete conditions of work and various standards of work appropriate to these conditions. Moreover, efficiency will call for a continuous improvement and simplification of the various elements in the concrete conditions. During recent years many sub-branches of production bearing on these have developed considerable literary warrant. Here are some of these sub-branches:-

1 Motion Study. It is an examination of each operation with a view to removing unnecessary movements, improving the methods of operating, determining the duration and location of rest periods to overcome fatigue, suggesting modification of tool, design, lay-out, fittings, furniture etc for consideration of the concerned specialists, and training new workers in the right way of working.

2 Time Study. It is fixing the time for each operation under the known conditions of operation, and helping in the calculation of the standard output per unit of time of a machine or a depot or a department, or a worker.

3 Improvement and design of tools and jigs, fixtures, gauges, patterns and templates, etc.

4 Machinery and Equipment for Handling Materials. This begins with the reception of raw materials and equipment at the plant, covers the movement of materials, equipment, finished parts etc through the desired points in the plant in the desired quantities and rates and ends with the despatch of the finished product from the plant.

5 Lay-Out of the Plant. This concerns the arrangement of the various manufacturing and storage centres, and aims to minimise handling and transport as the raw materials move steadily forward from the point of reception of new materials to the point of despatch of the finished product.

6 Location. This concerns the determination of the most favourable place for the factory in the light of proximity to the sources of raw materials and power, consumers, climatic conditions, transport facilities, security factors etc.

Items 1 and 2 taken together are denoted by the term Work Study. Gilbreth was the pioneer in this field.

224 Execution

The execution of the work in accordance with the plan, making the necessary adjustments in it as and when need arises in the course of the execution, supervising the workers, maintaining their morale, maintenance of quality standards, application of statistical control methods for the purpose, and keeping the necessary records for fixing the wages of each worker, etc form the core of production. This is the residue left over to the share of the executive engineer, after the various specialised sub-branches of industrial engineering established themselves.

225 Inspection

The purpose of Inspection is to control the standard of workmanship and finish of the commodities or services produced by the enterprise. In recent years, this sub-branch of production has begun to have literary warrant. Its literature deals with topics, such as

1 Checking of raw materials;

2 Checking the dimensional accuracy of very unit and operation;

3 Control of heat treatment process;

4 Checking the correctness of the sub-assemblies;

5 Checking the final assembly, its finish, and work-worthiness, and certifying it as fit for delivery; and

6 Checking the tools and gauges.

226 Plant Engineering

Another sub-branch calling for recognition is Plant-Engineering. There are articles on it, needing the attention of the classifier. There are even occasional books. It is generally a partial comprehension of various techniques, pooled together from the angle of the requirements of the auxiliary services within a factory. It usually comprehends power supply, industrial heating, maintenance of the machinery, tools, buildings, equipment, electrical installation, heating, ventilation, lighting, and safety-measures. This is like house-keeping. In every enterprise some part or other of this assignment will persist.

227 Purchase

Purchase usually covers about a half of the annual allotment of any enterprise. The progress of the work according to the time schedule will not be possible unless the necessary materials are available on time. Consolidating the requirements of all the departments in advance, placing orders, procuring them at the most favourable rates, checking the deliveries against invoices, and arranging for payment, come within the scope of the purchase department.

228 Stores and Material Control

A sub-branch forming a solid base of carrying out production programmes is concerned with the reception, palletising, storing, and issuing of all the purchased materials including raw materials, tools, jigs, and gauges. It is equally necessary for the intermediate commodities to be stored, issued for the further stage of production, and accounted for. So also the finished product should be stored till it is despatched away. The scraps too may have to be cared for; it becomes an important function in the enterprise of goldsmithy, for example; here even the shop sweepings will have to be treated for the extraction of filings and other minute pieces. In recent years, this sub-branch of Store-Keeping and Material Control has begun to develop literary warrant. As and when technology is able to utilise bye-products and retrieve them from wastage, they too will have to be stored and accounted for.

23 Personnel Management

Management is concerned with the achievement of maximal efficiency with the material and human resources brought together in an enterprise. Taylor initiated the branch closest to the material factor. Gilbreth contributed most to the combination of the two factors by initiating the branch on work methods, dealing incidentally with the application of the physiology of fatigue. The human factor in an enterprise is a far more complicated affair, since with man, as a living organism, go not only the vital body, but also the elusive complex of emotions, will, intellect, and -- equally important -- the capacity to combine and act collectively. And yet curiously, a systematic study of the management of the human factor has been late in emerging. No doubt, Personnel Management-in-action had been in existence all along. Robert Owen, for example, showed the way as early as the turn of the nineteenth century. But the pioneers in literary warrant were perhaps H W Gantt, B S Rowntree, and M P Follett. Their respective first books were Works, wages and profits (1910), Human factor in business (1921) and Creative experience (1924). A remarkable application of empirical scientific method to personnel management was the Hawthorne Experiment of the Western Electric Company financed by the Rockefeller Foundation and conducted from 1927 to 1947 -- about ten years of observation and another ten years of interpretation of the observed data. Several sub-branches of personnel management have begun to acquire literary warrant. Here are some of them:-

231 Employment

This includes

1 Liaison with sources like educational institutions, employment bureaux, and other state agencies concerned;

2 Interview, appointment, promotion, transfer, termination etc;

3 Initiation and follow-up of new recruits and interviews and consultations as and when required;

4 Hours of work, overtime, leave etc;

5 Conformity to the laws and regulations relating to employment.

232 Training

This includes -

1 In-training of employees at the commencement, and later for promotion or transfer to other kinds of work etc;

2 Initiation to and encouragement for taking additional full-time or part-time educational courses outside or inside work periods;

3 Suggestion of courses of self-education;

4 Provision of library service, publication of House Magazine, etc;

5 Conduct of tours to similar institutions, museums, exhibitions etc.

233 Wages

This includes -

1 Maintenance of wage structure;
2 Control of differential rates, special payments, change in individual cases based on efficiency, etc;
3 Deduction from wages etc.

234 Incentives

This includes not merely wages but other factors affecting morale, status, team-spirit etc.

235 Health and Safety

This includes -

1 Observance of the Factory Act;
2 Accident prevention and safety measures like systematic inspection of the factory and the machinery, and safety education;
3 Investigation of accidents and incidence of occupational diseases;
4 Medical services, medical examination, health records etc;
5 Fatigue study;
6 Workmen's Compensation Act.

236 Welfare Services

This includes -

1 Canteen provision;
2 Provision of social and recreative opportunities;
3 Assistance in housing, shopping, transport, etc:
4 Pension fund and other benevolent schemes;
5 Grant of loans;
6 Legal aid;
7 Advice on individual problems.

237 Industrial Relations

This includes -

1 Negotiation with Trade Unions;
2 Machinery for Joint Consultation, Production Committee, Work Committee etc;
3 Advice to employees in collective dealing;
4 Workers' grievances;
5 Out-side negotiations affecting personnel.

Sub-branches like industrial medicine, industrial psychology, and industrial training and legal advice come within the purview of the branch of personnel management, only for administrative purposes. Their technique will have to be classified with their respective main classes.

24 Public Relations

For eventual success, it is necessary for an enterprise to keep the consumers informed of itself . Virtually the potential world of consumers is the public. Even apart from this economic necessity, there is the democratic necessity to keep the public informed. The combined effect of these two forces is having its full sway to the point of making Public Relations a branch of management during recent years. A considerable literary warrant has begun to develop in this branch. Many enterprises from the government down to a private enterprise have begun to establish a public relations department. Its work is to disseminate information about the nature and the way of work of the enterprise, and about the commodities and services offered. It seeks to discover the public mind by opinion investigations. It strives to prevent and remove misunderstandings about the enterprise. The media it uses include printed hand-outs, the press, the radio, exhibits, motion pictures, tours, public addresses, and the guided conduct of individual visitors and groups of visitors round the scene of work of the enterprise. Courtesy and truthfulness should be its guiding principles. The pure methodology of public relations forms a main class by itself. Here we are concerned with its application.

25 Sales Management

Another important activity of any enterprise is the sale of its commodities or services. Sale essentially means making the consumer accept the commodities or services.

The over-all picture of sales-work presents many proliferations and sub-branches, each of which is rapidly gaining in literary warrant. It includes sub-branches covering diverse activities as shown below:-

251 Market Research

This includes -

1 Assessing of the suitability of the commodities or services to the market;
2 Finding of further markets;
3 Studying the competition in the field;
4 Finding the price load which the market can bear; etc.

252 Preparation for the Market

This includes -

1 Design and pattern;
2 Packaging with special attention to attractiveness, facility in opening and using; and
3 Trade-Mark and Brand.

253 Price Maintenance

This includes price maintenance all down the channel of distribution.

254 Channels of Distribution

This includes -

1 Selling direct to the public, usually adopted in highly specialised commodities, household appliances, and services like transport, entertainment and catering;
2 Selling direct to industrial users and other kinds of enterprises, raw materials, semi-commodities, tools, machinery, office equipment etc;
3 Selling through retail agencies, these being reached either directly or through wholesale agencies, or multiple or departmental stores;
4 Mail Order; and
5 Export Trade.

255 Advertisement

This will include -

1 Liaison with advertisement agents;
2 Media for advertisement like posters, newspapers and periodicals, direct mail, radio, cinema, illuminated signs, and various forms of point-of-sale media;
3 Advertising Production including the "message", the "copy", and the "illustration".

This is different from public relations, though the two overlap to some extent.

256 Sales Service

This includes only the administrative charge of the work. The actual service will have to be done by the production department. After-sales service is an important operation now being widely extended.

257 Physical Distribution

This includes -

1 Warehousing and storage;
2 Stock control, which will have to be of the perpetual inventory kind;
3 Despatch and Transport.

258 Sales Force

This may include -

1 Sales agent;
2 Travelling salesman;
3 Territory formation and Sales quota for the agent, salesman, or branch, as it may be.

Commerce can be an independent enterprise by itself. Here we are concerned with its application to an industrial or service enterprise.

26 General Office Functions

Put in general terms, General Office Functions centre round communication. This begins with the recording of all decisions, data, nd instructions. The records may have to be multiplied or at least copied for circulation within the concern or to outsiders. This leads to correspondence. It also calls for filing and archives work, the latter being concerned with he preservation of the records no longer in active use and the destruction of some of these according to a timetable. Simplification and standardisation will call for the design and use of forms and registers. Telephone and messengers usually fall to the share of general office functions. Mechanical aids like dictaphone, type-writer, duplicating machinery, filing receptacles and equipment, and several other gadgets are being developed for mechanising several general office functions. Considerable iterary warrant is therefore developing in the branch of General Office Functions.

27 Top Management

In the course of the description of some of the above branches, certain elements were pointed out as falling within the special purview of Top Management. As it is to-day, the literary warrant of the various other branches and sub-branches is so overwhelming as to hide away the literary warrant of Top Management. For, the literary warrant of this primary apical bud of management is relatively small. It is small because the essence of top management lies in the ineffable qualities of leadership and vision. It pervades every branch and seizes every one of it not in a detailed or gross manner, but in a general but subtle and life-giving way. By common consent, the literary warrant on this apical bud of management is taken to have begun with H Fayol's Industrial and general administration. Though it came out as a book only in 1925, its first appearance was in 1916 as a contribution to the Bulletin de la Societe de l'Industrie Minerale. It was based on his personal experience as managing director of Commentry-Fourchambault & Decazeville, one of the largest coal and iron enterprises of France for thirty years from 1888 to 1918. Top management was not merely the source of bread, but also the field of recreation and creative thought for Fayol. He did it during the hours of work and lived it during the hours of leisure. With great penetration, he was all along analysing the unanalysable elements of top management and seeking to express in objective terms what was ineffable. The results of his thought were first communicated in two papers -- the first in 1900 to the French Congress of Mining and Metallurgy, and the second in 1908 to the golden jubilee of the French Society of Mining Industries. It was this paper which was later elaborated into the classic published in 1916. In thus combining work under duress, leisure time occupation, and creative work and turning it all on one and the same subject, Fayol's life is a demonstration of the theory of happiness given in my Education for leisure (1948). He established the Paris Centre of Studies in Administration to spread the leaven. As a consultant to Government in World War I, he had the opportunity to apply this theory to military and civil enterprises.

271 Sub-Branches

The following are some of the sub-branches of top-management, which are gaining in literary warrant:-

1 Policy-Making. This includes the enunciation of the objective of the enterprise and the formulation of the broad principles forming the basis of its operations.

2 Organisation. This includes -

  1 The break-down of the whole work of the enterprise, needed for carrying out the policy, into its component organs;

  2 Fixing the authority, responsibility, and duty of each organ of the structure; and

  3 Fixing the nature of relation between the organs, such as Line Relation or the relation between superior and subordinates, Functional Relation or the relation between a specialist organ and the organ engaged in carrying out the main operation or the work of the main objective or subject of the enterprise; and

  4 Staff relation or relation describing that of a personal assistant to the chief, with no formal relation to any but the chief and yet forms as it were an extension of the personality of his chief in carrying out the responsibilities of the latter.

This is also called Planning.

3 Command. According to Fayol, this includes -

1 Issue of broad instructions to secure that the interest of the enterprise is not overshadowed by sectarian or individual interests;
2 Over-all supervision of work;
3 Maintenance of morale;
4 Discipline and sanctions against indiscipline;
5 Decision-making in situations presenting alternatives;
6 Observance of equity; and
7 Release of the creative element among the staff.

4 Control. This includes continuous review of the data brought up in the matter of budgetary, financial, production, material and sale controls from time to time.

5 Co-ordination. This includes -

1 Securing balance of activities among the organs and the individuals engaged in the enterprise;
2 Securing unity of effort; and
3 Establishing and watching the junction moments when different sections have necessarily to get dovetailed in their work.

This requires particular attention in respect of the subject-function and the service-functions within the enterprise -- that is the function forming the objective of the enterprise and the specialist services needed for the efficient discharge of the subject-function.

6 External Affairs. This includes contact and negotiation at policy level with agencies, outside the enterprise, in the political, economic, and social spheres both in the public and the private sectors.

28 Puzzle due to Interlocking

Two factors have been causing a puzzle in the designing of the classification of management, in addition to the difficulties caused by the late development of literary warrant in the subject and by the literary warrant developing first in the applied field and its not yet having developed appreciably in the pure field. This puzzle has been baffling classificationists. The two factors are of the nature of interlocking. The first interlocking is between knowledge of managerial skill and that of technical or subject skill needed in the production of the commodity or service, forming the objective of the enterprise. The second interlocking is between the different branches and sub-branches of management itself. To rationalise the classification of management, these two interlockings should be clearly seen, unlocked, and restored.

281 First Interlocking

Fayol did this for the first kind of interlocking. He showed that every participant in an enterprise -- workman to manager or clerk to head of state -- should have both managerial and subject skill. The difference lies only in the proportion of the two skills needed. To concretise the interlocking, Fayol gave an abstract model of the varying proportions among the employees of different positions, and for the heads of enterprises of different sizes. (vide table on the next page).

The benefit of the above sample analysis by Fayol is that we are able to realise that managerial function and subject function are separable and should be studied and therefore classified as distinct disciplines. Some acuteness is necessary to spot out the subject function in an enterprise. For example, it is Technology in a factory; Sale in a commercial business; Investment in a bank; Safety of the State and Social Welfare in a government. Since management is more abstract than enterprise, when both of them appear in mutual relation in a document, management should succeed enterprise, in the facet formula. This is according to the Principle of Decreasing Concreteness in the facet formula, which is more or less stabilised and may be taken as a corollary of the Canon of Increasing Concreteness to be satisfied by the sequence of classes both on the shelf and in the documentation list.

282 Second Interlocking

The second kind of interlocking is due to the fact that any branch or sub-branch of management throws forth all the branches peculiar to the main trunk management itself. In other words, any branch or sub-branch of manage-

Proportion of Skills in Percentage

Class of Employee in a large enterprise	Technical	Managerial						
		Total	Financial	Accounting	Commercial	Top	Other
Workman	85	15	0	5	0	5	5
Foreman	60	40	0	10	5	15	10
Shop Manager	45	55	0	15	5	25	10
Section Manager	30	70	5	20	5	30	10
Department Manager	30	70	5	10	10	35	10
Works Manager	15	85	10	10	15	40	10
General Manager	10	90	10	10	10	50	10
Head in an Enterprise of Size							
One-Man Business	40	60	10	10	20	15	5
Small	30	70	10	10	15	25	10
Medium	25	75	10	10	15	30	10
Large	15	85	10	10	15	40	10
Very Large	10	90	10	10	10	50	10
Head of State	8	92	8	8	8	60	8

nent becomes an enterprise by itself. In addi- on to its own distinctive technique, it admits f the skill of management also. There exist ocuments in which a particular branch or sub- ranch of management is the host class and he whole or any branch of management occurs n a facet of it. Let us illustrate. As an xample of moving up from the side of a sub- ranch to possible host branches, location and ay-out will arise as a sub-branch in top- nanagement, and every other department like roduction engineering, production control, ime-study, motion-study, tools, purchase, tores, accounts, budget, and general office. Again, as an example of moving down from the ide of a host branch to possible sub-branches, ve shall take the branch, General Office Func- ions, as the type. It has within itself most of he branches of management, in little.

1 Top Management:- Surely the object- ve should be stated and remembered, it may e taken as carrying out communication within nd without the enterprise with the greatest ossible efficiency. The work of the branch hould be properly parcelled out and distributed o groups of staff; this is organisation and plan- ing. The expenditure of the department should e watched and controlled; this is budgetary con- rol.

2 Location:- There should be liaison with heads of other departments; this is external affairs. The location of the General Office within the campus of the enterprise needs as much thought as the location of the campus itself.

3 Lay-out:- This involves the determination of the ideal flow of materials within the department, and the most economical distribution of the room of the chief and of the different sections oi the staff. There is a continuous output of contributions on this.

4 Tool Design and Maintenance:- The operation of the department requires many tools such as dictaphone, typewriting machine, filing cabinets and trays, not to speak of pen, ink, pencil, paper and other stationery. Some of these may have to be selected from the market and some may have to be designed to suit the particular requirements of the office. In either case, they will have to be maintained in an efficient condition.

5 Mechanical Handling:- We hear of office work being "Fordized"; that is the papers and files are carried by moving bands from the clerks performing one process to those performingthe next, the band finally emptying them at the despatch section through a chute.

6 Work Study:- There is ample scope to simplify and standardise clerical work with the aid of time-study and motion-study, and to design tables, chairs and other equipment to secure economy in the performance of work.

7:- Personnel:-. There is certainly a residue of personnel work to be done within the department to maintain morale, to formulate qualifications for staff, to make suggestions for training etc.

8 Production:- There is certainly need to produce a work chart for the details and the sequence of the various operations and to practice production control with the aid of the work chart.

9 Accountancy:- The subsidiary accounts of the department will have to be maintained And the budget of the department should be prepared.

It may happen that certain branches are thin and perhaps even absent in some cases. Some of the branches may give difficulty in identifying; but they can be isolated and named if some care is exercised. The difficulty is usually generated in the verbal plane.

283 Puzzle due to Locus

Puzzles arise also in regard to the placing of managerial documents in the over-all sequence of the classes.

1 In the first place, the inordinately slow emergence of literary warrant in the pure field of management, has caused a puzzle in securing a place for pure management among the main classes, that is in the array of the first order in the classification of the universe of knowledge.

2 Secondly, even in the applied field, the choice of the host class is a source of puzzle. In an enterprise engaged in the production and distribution of commodities and services catering to physical or near-physical wants, the host class is the appropriate industry-subdivision of the main class, economics.

3 In an enterprise engaged in satisfying mental, political, and social wants, the tendency is to use as host class the main class dealing with the technique of satisfying the want, e.g. library, hospital, education, political science, home economy, and law. The managerial documents of an institution are usually made to have the institution as the host class. However, all schemes do not decide these issues in the same way.

4 Further, there are some border line cases where it is difficult to decide whether the host subject for their managerial literature should be found in the main class economics or in the main class taking the technique of the production of the commodity or the service concerned. Newspaper management, home management, town and country planning, housing, and forestry are examples of border line cases.

5 Again within the main class economics, certain personality isolates other than an industry call to be treated as host class for their own managerial documents. Commerce, money, banking, public finance, and insurance are examples.

6 Moreover, on account of some reason or other, it has been the practice of taking out of industries and giving a distinct place in the personality facet of economics to the services of communication and transport. Therefore their managerial documents will have to go with them. This puzzle of course is something peculiar to economics itself.

7 With regard to the other puzzles, there is need to arrive at some agreed criterion to determine locus or host class of managerial documents in the applied field.

3 IDEA PLANE

Both in designing a scheme of classification and in applying it to the classification of a document, the first step is to analyse in the idea plane. This analysis is dependent on the universe of knowledge under consideration - its past development, the trend of its future development, and its structure. This is independent of the scheme of classification into which it has to be fitted. It is intrinsic to the subject itself. The analysis is best done in terms of the five fundamental categories personality, matter, energy, space and time and the concepts of round, level, facet, array, and zone. One naturally begins with the first round. It is often the first level of personality manifestation that needs first attention.

31 Personality Facet

The whole of section 2 is really a probe into the personality facet of round 1, level 1.

A local name should be improvised for it. Since the isolate ideas mentioned in section 2 correspond to the various functions arising in management, can we use the name Function Facet?

311 Array of order 1

The next point for decision is the preferred helpful sequence of the isolates in the array of order 1. Arranged by the Principle of Later in Time, a helpful sequence may be:-

Top-Management; General Office; Production; Public Relations; Sale; Personnel; and Accounts and Finance Departments.

There is a common tendency, however, to combine General Office, and Accounts and Finance. Moreover, Personnel is a service department covering all else. It may therefore be helpful not to put it in their midst. It is desirable therefore to put it at the beginning or at the end of the sequence. But it is unhelpful to oust Top-Management from the head of sequence. Thus the end of the sequence is suggested. The resulting sequence is:-

Top-Management; Production; Public Relations; Sales; General Office; Finance and Accounts; and Personnel.

312 Array of Order 2

We have next to decide, similarly, the helpful sequence in each of the seven arrays of order 2, arising respectively from the seven isolates of order 1. We shall take the second order array of Production for demonstration. Arranged by the Principle of Later in Time, a helpful sequence may be:

Plant Engineering; Simplification and Standardisation; Production Engineering; Purchase; Execution; Production Control; Inspection; and Stores and Material Control.

But there are a few special considerations Stores can also have claim to come immediately after Purchase. Further, Purchase is not of the same subject or technique germane to the enterprise, as Production Engineering on the one side of it, and Execution, Production Control and Inspection on its other side. It should therefore be rescued from its being jammed between high-brow techniques. The indication is that it may be brought down the sequence to just before Stores. Plant Engineering is like house-keeping. It too is not high-brow technique peculiar to the enterprise. A more helpful place will be near the end. The resulting sequence is:

Simplification and Standardisation; Production Engineering; Execution; Production Control; Inspection; Purchase; Stores and Materials Control; Plant Engineering.

The sequence of the isolates in the other arrays of order 2 should be fixed in a similar way. To save space, the results alone will be given in the schedule at the end.

313 Array of Order 3

We shall take the array of order 3 occurring under Production Engineering as the sample for study. According to the Principle of Later in Time, the following may be taken as a more or less helpful sequence:

Design and Development; Analysis into sub-assemblies, components, and operations; Specification, for each unit, of the standard of quality with limits of tolerance, the procedure for each operation, the tool etc, the extent of tooling, and the time for each operation (together called Production Chart); Specifying the quantity and quality of the materials required; Specifying the scrap permissible in each operation; Specifying the sequence of operations, the machine load and output, the semi-commodities to be purchased from outside, ensuring the correct quantity of materials and components, and fixing the over-all time-table (together called Production Planning); and Specifying the new machines, tools, gauges, etc required.

The sequences in the other arrays of order 3 and of higher orders should be fixed in a similar way.

314 Moot Point

The finding of the appropriate host isolate for Rate Fixing, Wage Fixing, and Price Fixing is a moot point. Can Rate Fixing and Wage Structure be a subisolate of personnel and Wage Fixing and Price Fixing subisolates of Accountancy? Or, should Rate Fixing and Wage Structure be isolates in array of order 1?

315 Level 2 of Personality

Perhaps the isolates in the personality facet of level 2 in round 1 should be made of the Boards, Committees, Offices etc made up of persons. In this the analogy may be taken from the schedule found useful in political science and the constitution of a country, with some modifications. The first isolate found there is 'Head'. Perhaps this may be retained, though the designation may vary as President, Chairman, etc. This isolate may have to be subdivided into Vice-Head, Deputy-Head, etc. if need arises. The second isolate found there is 'Executive'. This term has a different meaning in managerial literature. Its equivalent may be taken as Board of Directors, Committee of Management etc. The third isolate in political science is 'Legislature', and the fourth is 'Party'. In management, these may be replaced by 'General Body' and an intermediate body such as 'Council' between the General Body and the Board of Directors . The next division 'Local Body' in political science may be replaced by 'Committee'. There is a trend in the management of enterprises to have a body corresponding to 'Judiciary' in political science. Corresponding to it we may have to find a suitable term. Can we use the term "Officers" or "Executives"? To some degree and in some adapted form, these isolates will be applicable not only to the functional isolate Top-Management, but to every other isolate in the personality facet of level 1 in round 1.

32 Matter Facet

As in all other classes, in management too matter facet gives difficulty. It is conjectured that it may occur in the first round when the host personality isolate is Production, Finance, or Personnel. We should remember that the matter isolate in round 1 is an 'actand' that is, something on which the action denoted by the succeeding energy isolate is turned. In Production, it may be some physical material. In Work-Study, such as Time-Study and Motion-Study, it may be a person! In Finance, it may be some form of credit. Considerable experience in handling micro documents in the field is necessary to settle the schedule of isolates in the matter facet of round 1 suited to the various host isolates taken with the succeeding energy isolates in round 1. There appears to be no royal road to this except looking for micro documents presenting this facet and actually classifying as many of them as possible, with a provisional schedule, and modifying it tentatively in the light of the needs arising. Then only, it will be possible to arrive at a satisfactory, stable schedule.

33 Energy Facet

Fayol's analysis of the work of management yields the chief isolates in the energy facet of round 1 when the host is either the basic class Management or the personality isolate Top-Management. They may be thrown into a more or less helpful sequence as follows:-

Policy; Organisation: Function (Authority and Responsibility); Supervision to eliminate friction, waste, and deadlock and to secure smooth and efficient working; Co-ordination of the work of the different elements in the structure of the organisation; Providing cures in case of break-down; Improvement.

This sequence of isolates grafts as it were and is mnemonic with the isolates in the energy facet of Medicine, Political Science, and Sociology. When the host isolate in the preceding personality facet is anything other than Top-Management, a change is necessary in the isolates of the energy facet. For as stated in section 282, each of these isolates taken along with the main class "Management" is itself an enterprise in little. Therefore it has its own specific Techniques, which should figure as isolates in the energy facet. These specific energy isolates will have to be found out separately for each host isolate in the personality facet. Management can only be one of them. Therefore, th isolates appearing in the energy facet of the mai class will appear only in the energy facet of the second round having Management as the host isolates in the first round. This shift to a later round occurs in the management in every subjec in the applied field.

34 Personality Facet in Round 2

There is another result of each of the personality isolates other than Top-Management beng equivalent to an enterprise by itself. It is the ppearance, as isolates of round 2 after the energy isolate 'Management', of isolates similar to hose of the personality facet of round 1, in so far s the host isolate in the array of order 1 demands or permits.

35 Matter Facet in Round 2

The isolates for the matter facet, if any n the second round, will vary with the host.

4 VERBAL PLANE

There is near-chaos in the verbal plane, n the field of 'Management'. It clouds the isues in the idea plane. The construction of the chedule is therefore made difficult. The cloud n the idea plane aberrates the analysis in that lane. Therefore, the assignment of isolates o the different rounds, levels, facets, and even undamental categories suffers; and the syntheis to be done in the notational plane suffers qually. This difficulty is not peculiar to an nalytico-synthetic classification only. It dogs qually any enumerative classification at the tage when the classificationist builds the monoithic class numbers.

41 Main Class

There is no agreement even in the word y which the main class itself should be denoted. lanagement, Administration, and Organisation re the rival claimants. In certain applied fields ke government, local government, court of law, ospital, and library, Administration has been uch in use. On the other hand, in industry, enerprise giving service, landed estate, and eduation, Management has been much in use. In e former groups, Management is used to denote e branch 'Office Function'. In the latter group, dministration is used to denote that branch. In espair, as it were, L Gulick improvised an exressive initionym to denote the main class. It as Posdocarb (= Planning, Organising, Staffng, Directing, Co-ordinating, Reporting, and Budgeting). He launched this proposal in 1937. But it did not get established. The term Management is said to be gaining ground. It is said to have been adopted in the global sense at a meeting, held in 1910 in the apartment of Gantt, between Justice L D Brandeis (then a lawyer), Gantt, Gilbreth and a few other engineers, to prepare the brief in a case on Railway Freight Rates to be argued by Brandeis before the Interstate Commerce Commission of USA. Let us therefore adopt "Management" as the name of the main class.

42 Isolates

There is similar disagreement in the term for practically any isolate in the personality facet as well as the energy facet. Some examples of alternative claimants are given below.

> Top-management and Direction; Policy Making and Programme Planning; Director, Chief Executive, and President; Production Engineering, Process Engineering, Production Planning and Production Control; Production Manager, Works Manager, Works Engineer, Industrial Engineer; and Chemical Engineer. Public Relations, Information, Public Information, and Propaganda; Sales Manager, Sales Director, Sales Executive, and Commercial Manager; and use of Distribution in the place of Sale; Office Manager, Clerical Manager, Manager, and Administrative Manager; Personnel Officer and Welfare Officer, and about 60 other names; Board of Directors, Governing Body, Executive Committee, Managing Committee etc; Policy Direction, Plan, Objective and Purpose; Organisation, Plan, and Classification; Span of Control and Span of Supervision; Functional Service, Staff Function, and Service Function, as against Subject-Matter Function.

Perhaps the terminology in other languages is equally confusing.

43 Canons of Context and Enumeration

In any living language, words are always protein-like. Terminology is seldom stable. In a new discipline attracting literature for the first time, terminology takes long to get standardised. But the ideas get defined much earlier. To postpone the work of designing a scheme of classification till the terminology gets standardised would be like postponing to enter the sea until the waves stop. Nor is it practicable to load the schedule of classification with a formal definition of every term occurring in it. This is particularly true today in regard to Management. The only practicable course is to use the schedule of classification itself as the remedy. For, the schedule arranges the isolate ideas in an hierarchical sequence. The isolate numbers, reflect this hierarchical sequence. The classes and class numbers also have this hierarchical quality. If the isolate number or the class number is thrown in the form of a chain, the connotation of any link in the chain is shown by the complex of lower links. And the denotation of a link is made definite and unique by the complex of upper links. In my Prolegomena to library classification (Ed 2 ready for the press), the former method of finding the meaning of a term in a shcedule of classification is said to be governed by the Canon of Enumeration, and the latter, by the Canon of Context. These two canaons and the explanation given incidentally in Section 2 "Development of Branches" are brought into use in the schedules given at the end.

5 NOTATIONAL PLANE

While work in the idea plane depends only on the intrinsic attributes of the field of knowledge to be classified and not on the scheme of classification used, and work in the verbal plane depends on the natural language used and not on the ordinal language characteristic of the scheme of classification used, work in the notational plane has, by its very nature, to depend on the scheme of classification used. Therefore, this section and the succeeding ones have to be turned on a particular scheme of classification. It is now increasingly realised that the ever-dynamic nature of the universe of knowledge indicates the use of an analytico-synthetic scheme in preference to an enumerative one. In the latter, the rigidity of enumeration begins even at the very outset; while in the former, rigidity is relegated to a much later stage when fundamental constituent isolates are to be enumerated in the diverse facets.

51 Facet Analysis and Mixed Notation

The facet and phase analysis, to be implemented in an analytico-synthetic scheme, calls for a mixed notation. There should be at least two species of digits -- a species of substantive digits to represent isolates, and a species of digits for use as connecting symbols. This has been shown in my Report 5 to FID/CA (1955). BC, CC, and UDC are the only published schemes of universal coverage using distinct species of digits for these two purposes. In BC, it is only in an incipient stage.

52 Zone Analysis and Mixed Notation in an Array

The number of fundamental constituent isolates arising in an array is often greater than number of digits of any one species in common usage. This by itself may be met by the use of group notation. But, in many facets, an array has to be heterogenous; that is, some of its isolates are common to most host classes, while some are special to the particular host class under consideration; again, some isolates have to be got by enumeration, while others are better got by some device such as alphabetical, chronological, geographical or subject device; further, some are isolates proper, while others have to be quasi-isolates or characteristics for the formation of isolates proper. To meet the requirements of such a heterogeneity in its isolates, an array has itself to use a mixed notatio that is, it has to use substantive digits of different species. This leads to the formation of zones in an array. The implementation in the notational plane, of the findings of the zone analysis in the idea plane, is only incipient in UDC. It is more developed in CC. Its use of four species of digits — Roman small, Arabic numeral, Roman capital, and circular brackets used for packet notation -- enables the formation of four zones in an array, corresponding to these respective species of digits.

53 Law of Parsimony and Octavising Digit

Taking a base of the nine Arabic numerals, for definiteness, if the number of isolates in an array is greater than 9, group-notation be comes necessary. Suppose, for example, that the number of isolates is 10; then we have to use a group notation of two digits; and digits for an isolate number of the array becomes two. On the other hand, if we make the last digit of the species -- that is 9 -- a mere octavising and non-significant digit, the first eight isolate numbers need to have only one digit each and the two last isolate numbers only will have two digits each; thus the average number of digits for an isolate number of the array is only 1.2; this is more satisfying to the Law of Parsimony. This is examined in full detail in the forthcoming second edition of my Prolegomena to library classification. This gives rise to the concept of last octave, penultimate octave, etc in the third zone of an array; this leads to the convenience of specialising each of these octaves to accommodate special isolates got by a particular device -- say, alphabetical device in the last octave, chronological device in the penultimate octave, etc. Even if all the isolates in an array are to be got only by enumeration, the Law of Parsimony is satisfied, because, the total length of the array is then equal to the sum of the length of all the zones. A far greater number of isolates can be represented by a single digit in an array with a mixed notation than in one with a pure notation.

54 Law of Parsimony and Telescoped Array

Again, if we can be dead certain that the total number of isolates in the corresponding zones of two consecutive arrays will never exceed the length of the zone, the two arrays can be telescoped in the zone. This will make the average number of digits smaller than otherwise. This is studied in the forthcoming edition of the Prolegomena.

55 Telescoped Facet

It is found that a subject or an isolate in a facet of a subject can be expounded according to a particular system of exposition or may be studied only within a special restricted context or conditions. In Wage-Fixing, for example, we have the systems named after Halsey, Rowan, Bedaux, etc. In CC the systems are represented in the last octave of the third zone and the specials in its penultimate octave. We have so far come across this only in arrays of a personality facet. A system isolate can be followed by an isolate belonging to the first or the second zone of the same array, but separated by a comma in the notational plane -- as if they belonged to two different facets. This too gives satisfaction to the Law of Parsimony.

56 Increase in Versatility

To put it in general terms, the use of mixed notation, to provide for a distinctive set of connecting symbols and to mark off different zones in an array, adds to the versatility of a scheme of classification. In other words, it enables the notation of the scheme to keep step with more of the variegated demands of the universe of knowledge, experienced in the idea plane, than the use of pure notation.

57 Guinea-Pig

Since the CC has the greatest species of digits in active and differentiated use, it is chosen as the guinea-pig for demonstrating the work in the notational plane. The schedules in the later sections are CC schedules, for the same reason. To change over to the notation of an enumerative scheme or to a largely enumerative scheme like UDC, all possible class numbers may be synthesised from the CC schedules of isolates for the diverse facets and then an all-through enumerated schedule of class numbers may be arrived at.

6 SYMBOL FOR MANAGEMENT

We have to find a symbol for Management, as a main class and as an isolate. This has to be done in the case of many other concepts. For example, Law can figure as a main class as well as an isolate in some other class; so it is with Mathematics, Physics, and Chemistry. But there is an important difference between these latter subjects and Management. That is the difference in the sequence in which the appearance as an isolate and as a main subject came to be recognised. This has been discussed in section 15. Literary warrant had led to the recognition of certain subjects as main classes. In their case, their appearance as an isolate is looked after in the notational plane by the subject device. Management is not a subject of that nature. Pure Management has been described as a distillate newly being raised from applied fields in which it had been for long recognised and well developed as an isolate. In CC, a new main class of that nature is placed in the fourth zone; that is, it is represented by a packeted number. The number within the brackets is that of the subject with which it has had good association. This is largely a matter of judgment based on literary warrant. As need arises for such a new main class to be recognised, the users of the scheme should come to an agreement about the number to be put within the brackets.

61 Main Class Number

It is proposed that Pure Management may be denoted by (X). Another possible claimant is perhaps (W). How to choose between these claimants? The answer will depend on that to another question. Which has been more cultivated -- Public Administration or Management in the economic and industrial sphere? In which of these applied fields, literary warrant shows more of proliferation? It is believed that these have happened more in the industrial and economic field than in the other. It is in this belief, that (X) is proposed as the main class number for Pure Management.

62 Isolate Number

The significant digit in the isolate number for management has been 8. This means that the isolate number is 8 or 98 or 998, etc. It may be repeated that the isolate number cannot be got by the subject device in any applied field, as the main class number has itself been got from the applied field. This is true of all main classes accommodated in the fourth zone of the main array.

63 Similarity

The facet formula and the schedule for each facet to be used after (X) the main class will be the same as those to be used after the isolate 8, or 98, or 998 etc as the case may be.

7 SCHEDULE

Focus in Main Array

(X) Management

Focus in [1E] of some classes

8 Management

Note 1:- (X) accommodates only Pure Management.

Note 2:- 8 accommodates only Applied Management. Some host classes admitting 8 as energy focus are:

X9	Industry,
X5	Commerce,
X4	Transport,
X3	Communication,
X62	Banking,
X	Economics;
W	Political science;
V	History, with [1P1] added;
T	Education,
2	Library science,

with or without [1P1] added.

Note 3:- The facet-formulae for (X) and 8 are similar. The difference lies in what appear as round 1 in (X) appearing as round 2 if it follows 8.

Note 4:- It may happen that the isolate number for applied management is 98 or 998, in case 8 in the first octave is otherwise occupied.

Note 5:- The energy focus 8 may occur also with a class number denoting an institution as its host class number.

Note 6:- The rounds are mentioned in what follows, as for (X).

Foci in Array of Order 1 in [1P1]

1	Top-management
9A	Production management
B	Distribution
C	Finance and accounts
M	General office management
N	Public relation
Y	Personnel management

Note 7:- It is presumed that there is not much probability for either specials or systems or any categories deserving to be treated as if they are systems, to occur in management.

Note 8:- On this assumption, zone 3 also is used to accommodate enumerated special isolates.

Note 9:- At the same time, the number of isolates in array of order 1, as viewed from the idea plane, is far less than the total number of places in zones 2 and 3, taken together, in the notational plane. For, even if we restrict ourselves to the use of only two octaves in each of the zones, we get 64 places in the notational plane.

Note 10:- The above fact makes possible the telescoping of arrays in certain regions of the array of order 1, as it will be seen in the fuller schedule given hereafter. Such a telescoping results in economy in notation, much to the satisfaction of the Law of Parsimony.

Note 11:- If it eventually turns out that systems and specials do appear in management, zone 4 is kept as a reserve to accommodate them.

Foci in [1P1] (with notes interspersed in some places)

1	Top management
2	Board
2, 1	President
2, 2	Vice-President
2, 21	First vice-president
2, 22	Second vice-president
2, 8	Secretary
3	General body
5	Trustee body
6	Committee
(illustrative subdivisions)	
61	Agenda
62	Organisation
63	Building
64	Machinery
65	Market
66	Finance
67	Accounts
68	Staff
691	Annual report
7	Chief executive
8	Departments
91	Committee of the executives

Note 12:- Viewed from the idea plane, the isolates 2 onwards are subdivisions of isolate 1. As such, they belong to array of order 2. However, as viewed from notational plane, there is a telescoping of the two arrays. This has been made possible because there can be only one isolate as top management.

Note 13:- The divisions 2, 1 to 2, 8 represent a combination of [1P1] and [1P2]. President etc. obviously form organs of Board; and they, therefore, are isolates only in the facet forming level 2 of personality.

Note 14:- The foci in the second level of personality, mentioned above, are corresponding to similar ones in any managing body in any host class. The digit 1 is mnemonic for the Head and 8, for the administering staff.

Note 15:- The isolates 2 onwards in the array are more or less parallel to the corresponding sequence of isolates in political science and constitutional history. This satisfies the Canons of Consistent Sequence and of Scheduled Mnemonics.

Note 16:- Trust Board, as distinct from the Board of Management or Directors, exists in certain cases to watch and safeguard general interests. The digit 5 is used to denote it, mnemonically with its use for Civics in Political science and History.

Note 17:- The subdivisions of isolate 6 are listed as for an industrial enterprise, so far as the verbal plane goes. The same is true also in the case of all the isolates listed hereafter. If the host class is different from an industrial enterprise, the terms should be suitably altered. Many of the seminal ideas behind these isolates are likely to occur in most cases where 'management' appears as an energy isolate.

Note 18:- The Canon of Context should be used in interpreting the terms against the isolates 61 to 691. For example, '64 Machinery' means 'Committee of top-management on machinery'.

Note 19:- In general, the Canons of Context and Enumeration are presumed through-out the rest of the schedule, thus avoiding the kind of verbiage often occurring in UDC.

9A	Production management
9B	Product engineering
9B1	Single product
9B2	Double product
9B5	Multiple product
9B6	Bye product
9B8	Waste utilisation

Note 20:- 9B and its subdivisions are to accommodate only documents dealing with economic efficieny and the management of the section of an enterprise dealing with product engineering. Documents dealing with the technique of design, drawing, etc will go with the class in applied science forming the basis of the enterprise.

9C	Standards engineering

Note 21:- Viewed from the idea plane, 9B and 9C are subdivisions of 9A; as such, they belong to an array of later order than 9A. But, as viewed from the notational plane, the two arrays form together into a telescoped array.

Note 22:- Viewed from the idea plane, 9D to 9M are subdivisions of 9C; as such, they belong to an array of later order than 9C. But as viewed from the notational plane, the two arrays form together into a telescoped array.

Note 23:- Notes 21 and 22 together imply that the array of order 1 of the facet [1P1] is one in which three arrays of order 1, 2 and 3 respectively stand telescoped.

9D	Machinery
9D1	Selection
9D2	Capacity
9D4	Obsolescence
9D5	Replacement
9D6	Drive
9D61	Individual
9D62	Common
9D7	Operation

More concrete sector

9DB to 9DY Specific machinery, to be named for each enterprise in relation to its own context.

Note 24:- The term 'machinery' is used in the limited sense of power-driven machinery used to change in some way the material being processed, and it excludes small tools, jigs, fixtures, etc used with machinery; it also excludes any equipment used for handling material. This is as applied to a manufacturing enterprise.

Note 25:- The significance of the term 'More concrete sector' is as follows:-

A document may cover an isolate of zone 2 and an isolate of zone 3 as well. Then, the isolate of zone 3 will appear in the class number as an isolate of [1P2], that is as an isolate of the facet of the next level. The two isolate numbers will, of course, be separated by the connecting symbol comma. In other words, we have in the schedule the phenomenon of telescoped facets, described in Annals of library science, 2, 1955, 68-74, and in the forthcoming second edition of the Prolegomena to library classification. Example:-

2	Library science
2:6	Circulation work
2:6:8	Circulation management
2:6:89D	Issue machinery
2:6:89D, 7	Operation of issue machinery
2:6:89DC	Electronic issue machinery
2:6:89DC, 7	Operation of electronic issue machinery

In a subject like this, which is not an industrial enterprise, the term 'machinery' should not be restricted to power-driven machinery, as stated in note 24.

9E	Tool etc
9E1	Design
9E2	Construction
9E3	Sharpening
9E4	Replacing
9E5	Coolant
9E6	Issuing
9E7	Operation
9E8	Tool crib

More concrete sector

9EA	Tool
9EB	Abrasive
9EC	Blanking
9ED	Drilling
9EE	Paring
9EF	Cutting
9EG	Slotting
9EH	Hammering
9EK	Fire
9EN	Jig
9EP	Fixture
9EQ	Mandrel
9ES	Arbor
9ET	Template
9EW	Wrench
9EX	Gauge

Note 26:- The significance of the term 'More concrete sector' is similar to the one described in note 25. The connecting symbol for sector 1 is comma.

9F	Material handling equipment
9F1 to 9F7	Similar to 9D1 to 9D7

More concrete sector

9FB	Transfer
9FC	Transport
9FD	Horizontal
9FD1	Fixed path
9FD5	Variable path
9FE	Vertical

9FE1	Fixed path
9FE5	Variable path
9FF	Horizontal and vertical
9FF1	Fixed path
9FF5	Variable path
9FP	Gravity
9FQ	Muscular power
9FR	Mechanical power
9FS	Hydraulic
9FT	Pneumatic
9FV	Thermal
9FW	Electrical
9FY	Atomic

Note 27:- The isolates 9FB to 9FF5 are based on the nature of the handling to be done; while the isolates 9FP to 9FY are based on the kind of power used in the handling. A document may cover any isolate of the first of these groups as well as any isolate of the second group. In that case, the auto-bias device should be used; that is, the isolate number of the first group should be followed by the isolate of the second group, with a hyphen separating them. Example;

9FE-P	Chute
9FE-P3	Spiral chute
9G	Automaton

9G1 to 9G7 similar to 9D1 to 9D7

9H	Power
9H1	Selection
9H2	Capacity
9H3	Source
9H31	Production
9H35	Purchase
9H5	Change

More concrete sector

9HR to 9HY similar to 9FR to 9FY

9J	Furniture
9K	Location
9K1	Selection
9K2	Capacity
9K3	Centralised
9K4	Scattered
9K5	Change

More concrete sector

9KB	Zone
9KC	Country
9KD	Region
9KE	Place
9KF	Site
9L	Lay-out
9L1	Orientation
9L2	Capacity
9L3	Centralised
9L4	Scattered
9L51	Single floor
9L55	Multifloor
9L95	Remodelling

More concrete sector

9LC	By product
9LE	By process
9LJ	By machinery
9LM	Mixed

Foci in [1P2] for "9L Lay-out"
The foci 1 to Y of [1P1] and their subdivisions are to be adapted suitably.

Note 28:- The foci in [1P2] are to be used only to indicate their respective positions, in so far as the general lay-out needs their consideration. Example:-

X9:89L,1	Location of top-management
X9:89L,9A	Location of production engineering office
X9:89L,9V	Location of stores
X9:89L,F	Location of accounts office
X9:89L,M	Location of general management office

Note 29:- But the details of the internal lay-out of the foci in [1P2] should be accommodated in the second round of facets for the corresponding focus in [1P1]. Example:-

X9:89E:89L	Lay-out of tool cribs
X9:89D:89L	Lay-out of machinery
X9:891:89L	Lay-out of office of top management

9M	Work study
9M1	Motion study
9M11	Process analysis
9M12	Operation analysis
9M13	Micromotion study
9M3	Therbligs
9M31	Transport empty
9M32	Transport loaded
9M33	Pre-position
9M34	Grasp
9M35	Release load
9M36	Hold
9M37	Position
9M38	Unavoidable delay
9M391	Avoidable delay
9M392	Balance delay
9M393	Direct
9M394	Inspect

9M395	Select
9M396	Search
9M397	Plan
9M4	Fatigue study
9M42	Physical
9M45	Mental
9M5	Rest period
9M6	Time study
9M61	Base time
9M65	Effective time
9M7	Delay
9M71	Operational
9M715	Cleaning
9M717	Inspection
9M75	Factory
9M751	Material
9M752	Machine
9M753	Tool
9M754	Instruction
9M755	Away from work
9M77	Personal
9M771	Late beginning
9M772	Talking
9M773	Food etc
9M774	Pause
9M776	Away from work
9M778	Early stop

More concrete sector

9MA	Working conditions
9MB	Design
9MC	Drawing
9MD	Machinery
9ME	Tool, jig etc
9MF	Material handling
9MG	Material
9MJ	Furniture
9MN	Vibration
9MP	Noise
9MQ	Heat
9MR	Humidity
9MS	Light
9MT	Nourishment
9MU	Time of day
9MV	Duration
9MW	Monotony
9MX	Sanitary condition
9MY	Safety arrangement

Note 30:- The isolates in zone 2 of 9M are to hold documents dealing with standards in regard to the respective isolates.

Note 31:- Naturally the standard will be dependent on the working conditions. The isolates defining the working conditions are given in zone 3.

Note 32:- The isolates in zone 3 of 9M are to hold documents dealing with standards in regard to the respective isolates.

Note 33:- A document may cover an isolate in zone 2 and another in zone 3. Then, the isolate of zone 3 will appear as an isolate of [1P1] while, the isolate of zone 2 will appear as an isolate of [1P2], that is as an isolate of the next level. The two isolate numbers will be separated by a comma.

Note 34:- It is necessary to subdivide the isolates of zone 3 into different standards of abnormality, in order to apply the provision in note 33. This can be done only after such standards of abnormality get established in the published documents.

Note 35:- The Canon of Enumeration furnishes the denotation of most of the terms in the divisions of work study and of "work study" itself. But the following terms need to be defined:-

"Motion study" consists of dividing work into its most fundamental element/elements possible; studying these elements separately and in relation to one another; and from these studied elements when timed, building methods of least waste. -- Gilbreth

"Process analysis" is the division of a piece of work into its constituent jobs or operations and the related movement of materials, if any; it is followed by a study of the necessity and effectiveness of each constituent operation in the performance and completion of the piece of work. This has been called "job analysis" in my Library administration (1935).

"Operation analysis" is the division of an operation into its motion-elements; it is followed by a study of the elements that can be eliminated, or combined, or may be made in a different sequence, and of "the one best way" of doing the operation; the degree of resolution is a matter of flair.

"Micromotion study" is the time-measurement for each of the motion-elements or therbligs of an operation or job.

"Time study" is the determination of the ime required to do an operation in "the one est way"; its chief use is in setting standards or 'base wage'.

In micromotion study, time is measured ften correct to .0005 minute with a micro-hronometer and with a motion-picture-film, nd simo graph.

In time study, time is usually measured orrect to .02 or .03 minute with a stopwatch, r correct to .01 minute with a Marstochrone.

9N	Production engineering
9P	Production planning
9P1	Product analysis
9P11	Dimension
9P12	Tolerance
9P13	Quality
9P15	Quantity

More concrete sector

9P1B to 91PY Parts to be listed in the context of the product concerned

9P2	Material analysis
9P23	Quality
9P25	Quantity
9P251	Net
9P253	Scrap
9P254	Wastage
9P255	Gross

More concrete sector

9P2B to 9P2Y Materials to be listed in the context of the product concerned

9P2ZB to 92PZY Parts to be purchased to be listed in the context of the product concerned

9P3	Operation instruction
9P31	Machine load
9P32	Tools
9P33	Setting time
9P34	Cutting speed
9P35	Feed
9P36	Time
9P361	Base
9P362	Allowance
9P363	Total
9P37	Sequence of operations

More concrete sector

9P39B to 9P39Y Parts to be listed in the context of the product

Still more concrete sector

9P3B to 9P3Y Parts to be listed in the context of the product

Note 36:- As viewed from the notational plane the above appears to be a single facet. But viewed from the idea plane, it is a telescoped facet. Three consecutive facets stand telescoped. The class number of a document covering an isolate from each of the three sectors will present all the three facets. The facets will be in the decreasing sequence of concreteness. The connecting symbol for any sector is comma.

9P4	Subassembly
9P41	Components
9P42	Materials
9P43	Operation instruction (to be subdivised as 9P3)
9P5	Assembly (to be subdivided as 9P4)
9P6	Scheduling
9P61	Commencement
9P65	Subcontract
9P68	Completion

The more concrete sectors and the note, similar to those under the isolate 9O

9P7 Work flow

9P7B to 9P7Y Parts to be listed in the context of the product

9Q	Production control
9Q1	Despatch
9Q2	Material feed
9Q3	Machine loading
9Q34	Idle machine
9Q4	Tools feed
9Q5	Quality control
9Q6	Time recording
9Q7	Chasing
9Q8	Quantity control

More concrete sector

9Q9B to 9Q9Y Operations to be listed in the context of the parts and product

Still more concrete sector

9QB to 9QY Parts to be listed in the context of the product

Still more concrete sector

9QZB to 9QZY Subassemblies and assembly to be listed in the context of the product

Note 37:- When two or more facets appear, the connecting symbol is comma for any sector.

Note 38:- When the number of operations or parts warrant it, group notation may be used.

Note 39:- 9N to 9Q form a telescoped region. 9P and 9Q are subdivisions of 9N.

9R	Execution
9S	Inspection
9S1	Trial
9S2	Working
9S3	Key operation
9S4	Function
9S5	Efficiency
9S6	Endurance
9S7	Destructive
9S91	Field or patrolling
9S95	Centralised

More concrete sector

9S9B to 9S9Y Operations to be listed in the context of the parts and product

Still more concrete sector

9SB to 9SY Parts to be listed in the context of the product

Still more concrete sector

9SZB to 9SZY Subassemblies and assemblies to be listed in the context of the product

9T	Material control
9T1	Standard
9T2	Indent
9T4	Inspection
9T5	Inventory turn-over
9T51	Maximum
9T52	Minimum
9T53	Order point
9T54	Danger point
9T55	Standard order
9T58	Physical verification

More concrete sector

9TB	Material
9TC	Parts (purchased)
9TCE	Parts (manufactured in factory)
9TD	Machine
9TE	Tools
9TF	Handling equipment
9TH	Power
9TJ	Factory supplies
9TJ1	Waste and wiping rags
9TJ2	Lubricating oils
9TJ3	Cutting oils
9TJ4	Pickling solutions
9TK	Construction materials
9TM	Spare parts
9TN	Work in progress
9TQ	Office supplies
9TR	Janitor supplies
9TS	Containers
9TT	Vehicle
9TV	Plant engineering materials
9TW	Personnel division materials
9TX	Salvaged materials
9U	Purchase
9U1	Indent analysis & grouping
9U2	Source
9U21	By geographical area
9U22	By standing
9U25	Reciprocity
9U27	Personal influence
9U274	Gift and bribery
9U3	Price acceptance
9U31	Price list
9U32	Quotation
9U33	Tender (competitive)
9U35	Negotiation
9U4	Buying method
9U41	Ad hoc
9U42	Forward
9U43	Scheduled
9U44	Speculative
9U45	Renting
9U46	Hire
9U47	Group
9U48	Blanket order
9U5	Lot-size
9U6	Order
9U61	Order without price
9U7	Chasing
9U8	Invoice

More concrete sector

9UB to 9UY Similar to 9TB to 9TY

9V	Store
9V1	Receiving
9V2	Rejecting
9V3	Stacking
9V4	Protection
9V41	Fire
9V42	Corrosion
9V43	Dust
9V44	Evaporation
9V45	Humidity
9V46	Weather
9V47	Theft
9V48	Insect

9V5	Lot-size
9V6	Issue
9V65	Return
9V95	Class symbol

More concrete sector

9VB to 9VY Similar to 9TB to 9TY

Note 41:- 9T to 9V form a telescoped region. 9U and 9V are subdivisions of 9T.

9W	Transport
9X	Plant engineering
9X1	Inspection
9X2	Cleanliness
9X3	Maintenance (preventive)
9X34	Painting
9X35	Oiling
9X4	Repair
9X5	Change and reconstruction
9X6	Installation and construction

More concrete sector

9X9B	Earthwork
9X9C	Masonry
9X9D	Wood work
9X9E	Steelwork
9X9F	Aluminium
9X9G	Copper
9X9H	Other metals
9X9J	Concrete
9X9K	Reinforced concrete
9X9M	Glass work
9X9N	Ceramic work
9X9P	Plastic
9X9R	Rubber
9X9S	Leather
9X9T	Textile
9X9Z	Other materials

Still more concrete sector

9XB	Building
9XB1	Foundation
9XB2	Floor
9XB4	Support
9XB41	Wall
9XB45	Pillar
9XB5	Stairway
9XB6	Roof
9XB61	Beam and truss
9XB62	Rafter
9XB63	Covering
9XB7	Window
9XB8	Door
9XC	Service connection
9XC1	Water
9XC2	Drainage
9XC3	Gas
9XC4	Steam
9XC5	Oil
9XC6	Other liquids
9XC8	Compressed air
9XD	Working condition
9XD1	Ventilation
9XD2	Vibration
9XD3	Noise
9XD4	Heat
9XD45	Humidity
9XD5	Light
9XD8	Air conditioning
9XE	Yard
9XE1	Landscape
9XE2	Roadway
9XE3	Walkway
9XE4	Parking space
9XE6	Fence
9XE7	Outdoor signs
9XF	Yard structures
9XF1	Water tank
9XF2	Drain
9XF3	Crane structures
9XF4	Rail tracks etc
9XF5	Other structures
9XF6	Tunnels
9XF7	Conduits
9XG	Safety equipment
9XH	Fire-fighting equipment
9XH1	Extinguisher
9XH2	Hydrant
9XH3	Hose
9XH4	Sprinkler
9XH5	Pail
9XH6	Truck
9XH7	Ladder
9XH8	Other tools
9XJ	Watchman's equipment
9XK	Safety measure device
9XK1	Railing and other guards
9XK2	Floor marking
9XK3	Warning signal
9XM	Vehicles
9XN	Electrical equipment
9XP	Power plant equipment
9XP1	Generator
9XP4	Transformer

9XP5	Switchgear
9XP6	Control room
9XP8	Storage
9XQ	Transmission
9XQ1	Underground
9XQ2	Overhead
9XQ4	Cutout
9XQ5	Power outlet
9XQ96	Lightning protection
9XR	Utilisation
9XR1	Motor
9XR3	Communication systems
9XR31	Signal
9XR33	Telephone (internal)
9XR34	Furnace
9XR35	Light
9XS	Equipment
9XS1	Metre
9XS2	Gauge
9XS3	Recording devices
9XS5	Electronic control
9XT	Mechanical equipment
9XU	Steam power
9XV	Furnace
9XV6	Heat treatment equipment
9XW	Drying equipment
9XX	Operating equipment
9XX1	Machinery
9XX2	Tools
9XY	Material handling equipment

Note 42:- When two or more facets appear the connecting symbol is colon for sector 1, and semicolon for sector 2.

9ZB	Development
9ZC	Laboratory scale (experiment, research)
9ZD	Pilot
9ZE	Prototype

Note 43:- The above four isolates in the second octave of the penultimate octave form a more concrete sector than the one formed by its first octave. This means that there is telescoping of facets, as viewed from the idea plane. In other words, a class number may have a facet made of an isolate taken from the second octave and an additional facet of a later level taken from the first octave of the penultimate octave. For example 9ZD, 9Q5 is quality control for prototype.

Note 44:- The resulting sequence violates the Principle of Later in Evolution, in as much as it puts the stages of development to prototype posterior to the stage of manufacturing. This is an unhappy result imposed by notational exigency. The only justification in its favour will have to be invoked by applying literary warrant and arguing that this sequence is in accordance with the Principle of Favoured Category.

Note 45:- Zone 2 of array of order 1 of [1P1] is independant of the product or the service produced by the enterprise. But, as the schedule shows, the penultimate octave of zone 3 of array of order 1 depends on the product or the service concerned. The last octave of zone 3 of array of order 1, being scheduled hereafter, is common virtually to all enterprises.

B	Distribution
B1	Market research
B11	Demand
B111	Quantity
B112	Quality
B116	Seasonal fluctuation
B12	Supply
B16	Price load
B2	Sales promotion
B21	Visual method
B211	Flair
B212	Exhibition
B213	Show room
B217	Demonstration
B22	Graphic method
B221	Package label
B225	Picture
B227	Film
B23	Trade name
B24	After-sale-service
B25	Guarantee
B26	Premium scheme
B261	Gift
B262	Coupon
B28	Group method
B281	Consumer Board
B282	Retailer Board
B285	Wholesaler
B3	Advertisement
B31	Medium

B311	Leaflet
B3111	Personal distribution
B312	Poster
B3122	Static
B3123	Moving
B3125	Illuminated sign
B313	Radio
B314	Cinema
B315	Television
B316	Press
B317	Talk
B318	Sky-writing
B32	Legend
B322	Composition
B325	Picture
B328	Typography
B36	Time
B361	Pre-production
B362	After-production
B363	Continuous
B364	Discontinuous
B365	Special occasions
B37	By audience

Note 46:- More than one of the above isolates can be combined by auto-bias device.

B4	Physical distribution
B41	Packaging
B418	Opener
B44	Transport
B441	By kind (To be divided by vehicle as in D5 Engineering)
B442	By ownership
B4421	Self
B4425	Public
B4427	Private
B48	Area
B481	Local
B482	Inland
B485	Foreign
B5	Channel
B51	Direct
B52	Retailer
B55	Wholesaler
B56	Distributor
B57	Agent
B6	Price
B61	Price differential
B62	Discount
B65	Price maintenance (Divide as B5)
B7	Selling

Note 47:- Only those isolates are given which pertain to manufacturing enterprise qua manufacturing enterprise. But commerce and advertisement are by themselves independent enterprises; and there will be many more isolates, pertaining to them and given under them.

C	Finance and accounts
D	Finance
D1	Demand
D2	Raising
D3	Increasing
D4	Reducing
D5	Investment
D7	Allocation
D8	Control
D84	Variance
D86	Correction

More concrete sector

DB	Net worth
DC	Issued capital
DC1	Ordinary shares
DC11	Founders'
DC12	Deferred
DC13	Preferred shares
DC2	Preference shares
DC21	Capital
DC22	Profit
DC23	Participating
DC24	Non-participating
DC25	Cumulative
DC26	Non-cumulative
DC27	Redeemable
DC28	Non-redeemable
DC3	Bonus shares
DC4	Owner's capital
DC7	Endowment funds
DD	General reserve
DD1	Capital
DD2	Revenue
DD5	Secret reserve
DE	Borrowed capital (Liabilities)
DE1	Accrued
DE2	Medium term
DE3	Long term (Fixed)
DE5	Debentures
DE6	Provisions
DE7	Loan (Creditors)
DF	Assets
DG	Fixed assets (Fixed capital)
DG1	Tangible

DG11	Land
DG12	Buildings
DG13	Machinery
DG14	Vehicles
DG15	Fittings and furniture
DG18	Subsidiary companies
DG2	Intangible
DG21	Goodwill
DG22	Patent
DG25	Trademark
DG4	Fictitious
DG41	Preliminary expenses
DG42	Loss
DH	Current assets (Circulating capital)
DJ	Working assets
DJ1	Finished product
DJ2	Work in progress
DJ21	Subassemblies
DJ23	Components
DJ3	Materials
DK	Liquid assets
DK5	Investment (Debtors)
DK6	Cash
DN	Expenditure and income
DP	Expenditure
DQ	Income
DR	Profit
DR1	Factory (or Working) surplus (-Gross sales (less returns) minus Normal recurring manufacturing (or service) expense including depreciation)
DR2	Gross trading profit (-Factory surplus minus Abnormal nonrecurring expense)
DR3	Net trading profit or (Gross profit) (-Gross trading profit minus fixed expenses such as for marketing, administration, design, research, interest on borrowed capital)
DR4	Net profit (-Net trading profit minus sundry income not from trading)
DR5	Final profit (Balance from profit) (-Net profit minus expenses, not arising from the trading and not relating to the period of the profit, e.g. Tax, Gift, etc)
DR6	Final profit after adjustment (-Final profit plus or minus adjustment for accuracy of account)
E	Budget
E1	Forecasting
E11	Quantity
E16	Money
E2	Preparation
E21	Quantity
E26	Money
E3	Approval
E4	Revision
E8	Control
E84	Variance
E86	Correction
E91	Form of presentation
E91	Ratio
E913	Graph
E914	Chart
E916	Table
E917	Narrative
E92	Internal structure
E921	Preliminary legends
E922	Vertical headings
E923	Horizontal headings (Classification)
E924	Code symbols

More concrete sector

E9B	Basic
E9C	Current
E9M	Fixed
E9N	Flexible

Still more concrete zone

EB	Sales budget
EC	Manufacturing budgets
ED	Production
EE	Materials (Direct only)
EF	Labour (Direct only)
EG	Manufacturing expense (On cost = Indirect expense only = Factory Overhead:- Variable like supplies, semivariable like, indirect labour and indirect materials, and fixed like rent, rates, depreciation)
EH	Purchase (All materials including direct, consumable, and capital goods)
EJ	Capital expense (Plant and equipment, including addition, betterment, repairs, replacement, renewal, prolongation of life in the case of plant (= buildings plus more or less stationary equipment

and equipment (= movable physical property used in production with life longer than one year), and their depreciation)

EK	Expense budgets
EL	Selling
EL3	Advertisement
EM	Financial (Treasurer)
EN	Executive (Direction)
EP	Corporation (General administrative)
EQ	Personnel
EQ5	Welfare
ER	Auxiliary (= Other departments, such as Purchase office, Stores office, Office Manager's office. To be numbered on a single digit basis or group basis according to their total number)
ES	Cash budget (Finance budget)
ET	Finance programme
EW	Estimated balance sheet
EX	Estimated profit and loss account
EY	Master budget

Still more concrete sector

EZ	Subsidiaries, branches etc to be numbered EZB, EZC, etc with
EZY	Master budget to all combined

Note 48:- The class number of a document covering an isolate from each of the three sectors will present all the three facets. The facets will be in the decreasing sequence of concreteness. The connecting symbol is comma for any sector.

F	Accounts
G	Book-keeping
G1	Assembling relevant records
G2	Matching entries in records
G3	Calculation
G4	Verification
G5	Passing for payment
G6	Posting in books
G7	Adjustment
G917	Chasing
G92 to G94	similar to E92 to E924
G93	Physical structure
G931	Bound book
G932	Loose leaf
G933	Card
G934	Punched card

More concrete sector

G9A	Associated documents
G9B	Invoice
G9C	Bill
G9D	Voucher
G9E	Advice of payment
G9F	Receipt
G9G	Script, cheque
G9N to G9Y	Associated subsidiary books (To be divided in the context of the main book concerned)

Still more concrete sector

GA	Books
GB	Bills books
GB1	Bills payable
GB2	Bills receivable
GC	Purchase accounts
GD	Wages and salaries accounts
GE	Pension accounts
GF	Insurance accounts
GG	Taxes and rates accounts
GH	Royalty accounts
GH1	Mineral
GH2	Authorship
GH3	Patent
GK	Rent payable
GL	Interest payable (Borrowals)
GM	Other accounts (Payable)
GN	Sale accounts
GP	Royalty receivable
GQ	Rent receivable
GR	Interest receivable (Loans)
GS	Other accounts (Receivable)
GT	Statutory accounts of companies
GU	Cash books
GV	General cash book
GW	Payment books
GW2	Cheque payment book
GW6	Cash payment book
GX	Cash and cheques received book
GX2	Cheque received book
GX6	Cash received book
GY	Other cash books

Still more concrete sector

GZB to GZY	Different departments, subsidiaries, branches etc with
GZY	Consolidated account for all

Still more concrete sector

G(0)	Systems of book-keeping
G(1)	Single entry

G(2)	Double entry
G(3)	Treble entry

Note 49:- The connecting symbol for the first sector is colon and that for the others is comma, if more than one facet occurs.

Note 50:- The subsidiary books for different accounts should be enumerated according to the context of the basic account.

H	Accountancy
H1 to H4	similar to G1 to G4
H5	Conversion of foreign currency
H91 to H923	similar to E91 to E923

More concrete sector

HA	Statements
HB to HZY	similar to EB to EZY with HW subdivided into HWB
HWB to HWK6	similar to DB to DK6 and with HX subdivided into
HXN to HXR6	similar to DN to DR6
HXP and HXQ	to be subdivided into primary accounts in relation to the context of the enterprise

Note 51:- The connecting symbol for any sector is comma.

J	Audit
J1	Assembling relevant records
J2	Vouching
J4	Verification
J41	Error
J45	Fraud
J5	Investigation
J6	Rectification
J7	Certification
J8	Report

More concrete sector

J9A to J9ZY	similar to GA to GZY
JA to J(Z6)	similar to HA to H(Z6)

Note 52:- The connecting symbol for the first sector is comma.

J(ZA)	Systems
J(ZB)	Concurrent
J(ZC)	Post
J(ZD)	Test

K	Cost accounts
K1 to K4	similar to G1 to G4
K5	Allocation
K51	Primary
K52	Secondary
K6	Posting
K7	Adjustment
K8 to K92	Similar to E8 to E92
K93 to K934	Similar to G93 to G94

More concrete sector

K9A	Statements
K9B	Expenditure and income
K9C	Expenditure
K9D	Income
K9E	Pay roll
K9F	Standard cost
K9F1	Ideal
K9F2	Basic
K9F6	Normal
K9G	Book cost
K9H	Other costs
K9H1	Marginal cost
K9J	Prime cost
K9K	Material
K9K1	First-in-first-out
K9K2	Average
K9K21	Simple
K9K27	Weighted
K9K3	Standard
K9K4	Inflated
K9K5	Base stock
K9K6	Last-in-first-out
K9L	Labour
K9M	Overhead
K9N1	Scrap
K9N2	Spoilage
K9N4	Shortage
K9Q	Works overhead (Services) (To be divided as the primary accounts)
K9R	General overhead (Administration, selling and development etc)
K9S	Interest
K9U	Behaviour of overhead
K9U2	Fixed
K9U3	Variable
K9U4	Semi-variable
K9V	Recovery basis
K9W	Recovery rate
K9X	Absorption
K9X1	Underabsorption
K9X2	Overabsorption
K9V1	Material cost (Direct)
K9V11	Standard
K9V12	Actual
K9V2	Labour (Direct)

K9V21	Standard cost
K9V22	Actual cost
K9V25	Standard hours
K9V26	Actual hours
K9V3	Machine hours
K9V31	Standard
K9V32	Actual
K9V4	Blanket rate
K9V41	Cost
K9V45	Hours
K9V47	Units
K9V5	Department
K9V51	Departmental rate
K9V52	Cost
K9V53	Hours
K9V54	Units
K9V55	Departmental hourly cost
K9V56	Cost
K9V57	Hours
K9V58	Units
K9V6	Cost centre
K9V61	Cost centre rate
K9V62	Cost
K9V63	Hours
K9V64	Units
K9V65	Cost centre hourly cost
K9V66	Cost
K9V67	Hours
K9V68	Units
K9V7	Normal rate
K9V71	Cost
K9V75	Hours
K9V77	Units
K9V8	Supplementary rate
K9V81	Cost
K9V85	Hours
K9V87	Units
K9V91	Prime cost
K9V92	Market value
K9V95	Standard productive hour
K9V97	Unit

Still more concrete sector

KB	Product group
KC	Product
KD	Sub-assembly
KE	Component part
KF	Work in progress
KG	Department
KH	Cost centre
KJ	Operation
KP	Production (Direct)
KQ	Manufacturing service
KS	Administration
KT	Selling service
KU-KK	Similar to 9ZB to 9ZE

Still more concrete sector

K(0)	By nature of enterprise
K(1)	Specific order
K(2)	Continuous process
K(4)	Byproduct
K(5)	Joint product

Still more concrete sector

K(A)	System
K(B)	Subjective
K(C)	Social
K(D)	"Individual party"
K(N)	Objective

Note 53:- The connecting symbol for any sector is comma.

Note 54:- The penultimate octave of zone 3 will often need auto-bias device. The sequence of the isolates in it has been adjusted with this in view.

L	Estimating (To be subdivided on the analogy of "K Cost accounts")

Note 55:- Estimating quantities of materials belongs to the applied science concerned, such as **Engineering**.

M	Office management
M1	Inward mail work
M11	Receiving
M12	Opening
M13	Sorting
M14	Numbering
M15	Stamping
M16	Registering
M17	Matching with despatch register
M18	Distribution
M2	Outward mail work
M21	Sorting
M22	Numbering
M23	Stamping
M24	Registering
M25	Sealing and addressing
M26	Franking
M27	Matching with receipt register
M28	Mailing
M3	Communication work
M31	Oral
M32	Written
M33	Telephone

M34	Telegraph
M35	Teleprint
M4	Correspondence
M41	Assembling relevant records
M42	Digesting
M43	Noting
M44	Drafting
M45	Finalising
M5	Secretarial work
M51	Reception
M56	Scheduling
M6	Committee work
M61	Notification
M62	Agenda
M624	Amendments
M625	Amended agenda
M63	Meeting room
M631	Seating
M632	Stationery
M633	Blackboard
M634	Notes taking
M635	Lighting
M65	Minutes work
M651	Draft
M653	Circulation
M655	Final
M66	Communication
M67	Papers
M671	Collection
M672	Return
M7	Forms and registers work
M71	Paper
M711	Quality
M712	Shape
M713	Size
M714	Thickness
M72	Purpose
M721	Single
M722	Double
M728	Multi-purpose
M73	Lay-out
M731 to M734	similar to E921 to E924
M74	Review
M75	Revision
M78	Quantity
M8	Filing work
M81	Classifying
M82	Indexing
M83	Housing
M84	Protection
M85	Arranging
M851	Vertical file
M86	Issue work
M88	Transfer to archives
M91	Dictation
M92	Writing
M921	Shorthand
M925	Longhand
M93	Typing
M94	Duplicating
M942	Mechanical
M945	Photo
M946	Contact method
M947	Camera method
M948	Micro method
M96	Mechanical operations
M962	Cutting
M963	Punching
M964	Perforating
M965	Stapling
M968	Pasting
M98	Archive work
M981 to M986	similar to M81 to M86
M988	Destruction
N	Public relation
N1	Medium
N2	Publication
N23	House magazine
N26	Enterprise history
N27	Celebration (Jubilee, centenary)
N3	Open days
N4	Complaints disposal
N9	Other media
N91 to N98	similar to B31 to B318

More concrete sector

NB	Shareholders
NC	Visitors
NC1	Local
NC3	National
NC5	Foreign
ND	Public
ND1	Local
ND3	National
ND5	Foreign
NE	Press
NF	Educational institutions
NY	Special social groups (To be divided as in Y Sociology)
Y	Personnel work
Y1	Job evaluation
Y11	Job review (Collection of data)
Y12	Job specification

Y14	Job characteristics
Y141	Skill
Y1412	Physical
Y1414	Mental
Y143	Effort
Y1432	Physical
Y1434	Mental
Y144	Working conditions
Y145	Responsibility for
Y1451	Materials
Y1452	Equipment
Y1453	Methods
Y1455	Environmental factors (e g Market)
Y1456	Money
Y1458	Records
Y147	Personality
Y15	Job classification
Y16	Job rating
Y161	Straight-point method
Y163	Weight-point method
Y166	Direct-to-money method
Y191	Cadre strength
Y2	Merit rating
Y3	Wage (Salary)
Y31	Base rate
Y311	Sliding scale
Y313	Improvement
Y314	Tandem adjustment
Y32	Rate differentials
Y321	Holiday shift
Y322	Night shift
Y323	Overtime
Y33	Time rate
Y34	Piece rate, commission
Y35	Incentive plan (Extra-financial), (Premium plans)
Y351	Differential plan
Y352	High piece-rate plan
Y352G	Gantt plan
Y353	Differential piece-rate plan (Merrick)
Y354	Sharing plan
Y354B	Barth plan (Variable sharing)
Y354E	Bedaux plan
Y354H	Halsey (Constant sharing)
Y354R	Rowan plan
Y355	Empiric plan (Emerson)
Y356	Accelerating premium plans
Y358	Group incentive plans
Y3591	Quality premium
Y3592	Waste bonus
Y3593	Accident prevention bonus
Y3594	Indirect production plans
Y35941	Maintenance work
Y35942	Stores work
Y35943	Materials handling
Y35946	Inspection
Y35944	Tool-making
Y35945	Foreman
Y3595	Auxiliary services plan
Y35951	Commission bonus
Y35952	Profit bonus
Y36	Profit sharing
Y37	Stock-ownership
Y391	Real wage
Y392	Earnings
Y396	Take-home-pay
Y394	Sweating
Y395	Gratuity
Y397	Allowances
Y4	Safety measures
Y41	Safety education
Y411	New employee
Y412	Safety rules
Y42	Accident prevention
Y421	Hand tools
Y422	Mechanical machinery
Y423	Hydraulic machinery
Y424	Heat treatment equipment
Y425	Radiation
Y426	Electrical equipment
Y43	Fire-prevention
Y44	Disease prevention
Y45	Safety inspection
Y46	First aid
Y47	Follow-up
Y48	Investigation
Y5	Employment and service conditions
Y51	Labour sources
Y52	Recruitment
Y521	Application form
Y522	Interview, test
Y523	Selection
Y524	Induction
Y528	Employee record setting up
Y53	Status
Y531	Seniority
Y532	Transfer
Y533	Promotion
Y534	Demotion
Y54	Discipline
Y541	Rules
Y545	Offences
Y546	Penalties

Y55	Hours of work
Y5511	Part-time
Y5512	Over-time
Y552	Shift
Y5522	Double
Y5523	Continuous
Y5524	Night
Y56	Holiday, leave
Y562	Leave
Y5621	With pay
Y5623	Without pay
Y5624	Sick leave
Y5631	National service
Y5632	Civic duties
Y564	Absenteeism
Y5641	Lateness
Y57	Termination of work
Y571	Retirement
Y5714	Medical grounds
Y5715	Premature
Y5716	Efflux of time
Y572	Resignation
Y5725	For Marriage
Y573	Retrenchment
Y574	Dismissal
Y58	Social security
Y581	Pension
Y5812	Family
Y5817	Contributory
Y5818	Non-contributory
Y582	Provident fund
Y5827	Contributory
Y5828	Non-contributory
Y583	Workman's compensation
Y5832	Family
Y585	Social benefit
Y5851	Unemployment
Y5854	Medical
Y58544	Sickness
Y58544	Disability
Y58547	Injury
Y5855	Maternity
Y588	Social insurance (To be divided as Y585)
Y591	Turnover study
Y6	Employee services
Y61	Training facilities
Y615	Leave
Y616	Finance
Y62	Housing
Y624	Transport
Y63	In-plant food
Y64	Medical
Y643	Nursing
Y644	Hospital
Y645	Psychiatric
Y647	Dietary advice
Y65	Purchase
Y66	Finance
Y661	Mutual benefit
Y662	Savings plan
Y663	Credit union
Y665	Loan
Y67	Recreation
Y672	Library
Y673	Music
Y674	Dance
Y675	Outdoor games
Y676	Indoor games
Y677	Festivals
Y678	Excursion
Y68	Legal help
Y7	Industrial relations
Y71	Morale maintenance
Y72	Collective agreement
Y73	Negotiation
Y74	Conciliation
Y75	Mediation
Y76	Arbitration
Y761	Voluntary
Y765	Compulsory
Y77	Adjudication
Y78	Settlement
Y781	Call off

More concrete sector

Y7A	Strained relation
Y7B	Grievance
Y7C	Dispute
Y7C1 to Y79C6	similar to Y1 to Y6
Y79D	Strike
Y79E	General
Y79F	Partial
Y79G	Sympathetic
Y79H	Unsuccessful
Y79J	Stay-in
Y79K	Sit-down
Y79L	Go slow
Y79M	Picketing
Y79N	Boycott
Y79P	Sabotage
Y79R	Employer's methods
Y79S	Interference
Y79T	Strike-breaking

Y79V	Blacklisting
Y79W	Lock-out

Still more concrete sector

Y7A	Parties
Y7B	Employee
Y7C	Individual
Y7D	Trade union
Y7D1	General
Y7D2	Industrial
Y7D3	Craft
Y7E	Plant
Y7F	Local
Y7G	District (county)
Y7H	State
Y7J	Regional
Y7K	National
Y7L	Zonal (Continental)
Y7M	International
Y7N	Employer
Y7P to Y7V	similar to Y7F to Y7M
Y7W	Government
Y7X	State
Y7Y	National
Y7Z	International

Note 56:- Each of the foci Y7E to Y7V may be subdivided like the focus Y7D.

Note 57:- The connecting symbol is comma for any sector.

Note 58:- The isolates Y7W to Y7Z are to be used only for ad hoc, that is non-legislative action, if any.

Y91	Labour market
Y911	Under-employment
Y912	Over-employment
Y913	Unemployment
Y915	Full employment
Y92	Labour agencies
Y921	Appointment Bureaux
Y922	Employment Exchange

More concrete sector

Y9A	Grades
Y9B	Manual (Wage-earning)
Y9C	Unskilled
Y9D	Semi-skilled
Y9E	Skilled
Y9G	Supervisory (Foreman)
Y9N	Salaried
Y9R	Creative (Research)
Y9T	Technical
Y9V	Administrative
Y9W	Policy-making

Note 59:- Each of the above may be subdivided according to local context.

Still more concrete sector

YA	Types of labour
YB	Child
YC	Adolescent
YD	Adult
YE	Old
YE1	Retired
YE6	Pensioner
YF	Female
YF1 to YF46	similar to YB to YE6
YF5	Married
YF6	Pregnant
YF7	With children
YF8	Widow
YG	By time
YG4	Part-time
YG5	Seasonal
YG7	Permanent
YG8	Casual
YH	By area
YH1	Rural
YH3	Urban
YH5	City
YJ	By origin
YJ1	Local
YJ2	Inland migrant
YJ4	Refugee
YJ5	Emigrant
YJ6	Immigrant
YJ8	Vagrant
YK	By birth or status
YK2	Aristocracy
YK3	Middle class
YK4	Military class
YK5	Alien
YK8 to YK94	similar to 58 to 594 in [1P1] of the main class Y Sociology
YL	Honorary (Leisured class)
YM	By remuneration level
YM1	High-paid
YM8	Low-paid
YM93	Indentured
YN	Non-paid
YN2	Slave
YN3	Constraint
YN4	Forced (by individual)

YN5	Compulsory (by Government)
YP	Abnormals
YP2	Imbecile
YP4	Disabled
YP41	Crippled
YP42	Lame
YP43	Handless
YP5	Deaf
YP6	Dumb
YP7	Deaf and dumb
YP8	Blind
YQ	Prisoner
YR	By race
YR2 to YR9	similar to 71 to 79 in 1P1 of the main class Y Sociology

Note 60:- Connecting symbol is comma for any sector.

Note 61:- The term "Personnel Management" came into vogue only during the last thirty years or so. Before that, the term "labour" was used to cover more or less the isolates listed under Y.

Note 62:- Literary warrant is most heavy in the Labour or Personnel problems connected with the management of the enterprises engaged in the production of commodities and services, usually listed in "X Economics". The saving of even one digit in the class numbers of such problems will therefore integrate itself into a considerable saving in the aggregate. Therefore, the isolate number 8Y in the energy facet may be changed into 9, when the host main class is "X Economics".

75 Foci in [M]

The following foci in [M] may be used in any of the rounds according to the context of the host class:-

1	Formula
2	Graph
26	Break-even point
3	Chart
4	Table
5	Diagram
6	Template
7	Model
8	Instrument

Each of these may be subdivided by enumerated special characteristics or by chronological or by alphabetical device according to the context.

76 Foci in [E]

The following is one set of energy isolates applicable in many cases:-

1	Policy
2	Organisation
21	Span of control
22	Centralisation
23	Delegation
24	Responsibility
25	Authority

More concrete sector

2A	Factors for organisation
2B	Location
2D	Product
2E	Equipment
2F	Process
2K	Customers
2M	Function

Note 63:- The connecting symbol for the first sector is colon.

3	Function
4	Supervision
5	Co-ordination
8	Control

The following is another set of energy isolates in many cases:-

1	Assembling of relevant data
3	Analysis
4	Preliminary solution
5	Trial
7	Final solution
8	Reporting (Formulation)

Note 64:- In each context, it must be decided which of the above two schedules has more literary warrant. That should be used for the first octave; and the other schedule should be put into the second octave. In some cases, it may even have to go to the next round.

77 Foci in [T]

In many host classes, it may be necessary to prescribe the period of operation. This is indicated by the adding of time facet. The digit to indicate period is a. This digit should of course be preceded by a dot. If necessary, it may be followed by the unit of time used in measuring time and the number of units respectively. The schedule for all this has been worked out in the Annals of Library Science, 1, 1954, 68.

8 CONCLUSION

81 Examples

Some complicated examples are given. hese naturally contain simpler examples withn themselves. These simpler examples are got by omitting some of the facets in the examples given.

X9:89D2; 1	Formula for machine capacity
X9:89D5:7; 1M	Mapi formula for replacement of machinery
X9:89D5:7; 26	Break-even point for replacement of machinery
X9:89FC:89L; 5	Diagram for lay-out of materials transport equipment
X9:89L; 6	Template for lay-out
X9:89L95; 7	Model for re-lay-out
X9:89P25:7; 1C	Camp formula for lot-size for production
X9:89P25:7; 1N	Lehoczky formula for lot-size for production
X9:89P24:7; 1N	Norton formula for lot-size for production
X9:9Q3; 3G	Gantt chart for machine loading
X9:89Q5; 3	Quality control chart
X9:89Q9A; 3G	Gantt chart for operation control
X9:89QZA; 3G	Gantt chart for stock control
X9:89S9A:5; 4	Inspection log for efficiency of operations
X9:89U5:7; 1D	Davis formula for lot-size for purchase
X9:89X:3G	Gantt chart for maintenance work
X9:8DR; 3	Profit chart
X9:9J4, 9G, 62	Housing for refugee supervisors
X9:9J4, 9G, 7Y, L, 7	National Government's action on the adjudication of go-slow strike of refugee supervisors
(X)ET, 4	Revision of finance programme
(X)NC5, 3	Open-day for foreign visitors

The first 19 examples are in the field of applied management as applied to an industrial enterprise. The last two examples are in the field of pure management.

82 Retrospect and prospect

This is a first systematic attempt to apply the results of zone analysis, communicated in the Sixth Report (1956) to the FID/CA - the Committee of the International Federation for Documentation, on the General Theory of Classification. It demonstrates the possibility of economy in the idea plane, if zone analysis is applied. This has also laid bare many points that require investigation.

821 Technique of Telescoping

In effect, this is an experiment in the technique of telescoping different levels of facets of one and the same fundamental category.

8211 The importance of this was brought to my notice by B C Vickery and E J Coates, when I visited them in London in June 1954.

8212 The experience gained in doing this paper shows that facets of different fundamental categories should not be telescoped and that the telescoped facets should all belong to one and the same round of one and the same fundamental category.

822 Spread out into Levels

An implication of 8212 is that the different sectors in the telescoped facet spread out into different levels of facets if a document covers more than one sector.

8221 Another implication is that the connecting symbols for the levels so spread out should all be the same as for the fundamental category concerned.

823 Principle of Concreteness

To conform to the Principle of Increasing Concreteness among documents, it is necessary that the sequence of facets in the class numbers - that is, in the facet formula - should follow the Principle of Decreasing Sequence. This is the Principle of Inversion enunciated in the forthcoming edition of the Prolegomena to library classification. To secure this result, the sectors in the schedule of the telescoped facet should be arranged in Increasing Sequence of Concreteness.

8231 In developing this paper, there was temptation towards a pitfall. Relatively to the other sectors, the concreteness of the first sector was so low that it tempted to the prescription of a connecting symbol belonging to the fundamental category next in concreteness to the one to which the sector belonged in the enumerated schedule of the telescoped schedule. The first sector in the schedule of the personality schedule was taken to belong to the fundamental category energy and this was accordingly given colon as its connecting symbol.

8232 But the error was forcibly brought to notice, by the occurrence of homonymous class numbers, the facet formed by the first sector of the personality facet being indistinguishable from the regular facet of energy when it becomes necessary. Thus, the connecting symbol for the facet formed by the first sector was changed to comma.

824 Number of Sectors

It is found convenient to recognise the following as different sectors in the array of the first order in a telescoped facet:- 1 Zone 2; 2 Penultimate octave of Zone 3; 3 Last octave of zone 3; 4 Second octave within the last octave of zone 3 — that is, isolate numbers like ZA, ZB, ZC, etc; 5 Zone 4.

8241 These sectors should be in the Increasing Sequence of Concreteness.

8242 Similar sectors may also be formed in an array of second or later order. For example, the array of the second order having "Y7 Industrial relations" has sectors.

8243 If necessary, an additional sector can be formed with isolate numbers like (Z0), (Z01), etc. This sector will just precede the sector consisting of (Z1), (Z2), ...(ZA), (ZB), etc.

825 Relative Concreteness

The determination of the relative concreteness of the sectors, in the idea plane, is now a matter of judgement.

8251 By constructing schedules with sectors in many subjects - of course admitting of them - sufficient experience may perhaps be gained to have a fool-proof mechanical prescription for relative concreteness.

826 Isolate Numbers in Spread-out Facets

It is believed that the isolate number in a facet got by the spreading out of sectors can consist of only digits beginning with the digit occurring in the array whose sectors are spread out.

8261 It is this possibility that leads to economy in notation.

8262 But it needs confirmation that this will not lead to homonymous class numbers. This is a matter for investigation, by applying the principle to many documents in many subjects admitting of such telescoped facets.

827 Limitation in Scope

This elaborate technique of telescoping facets becomes necessary only in the depth classification of micro documents and in subjects of a specialist kind. In the classification of macro documents in the form of books and whole periodicals and in the subjects of popular interest, it does not arise.

8271 Further, the sectors in zone 3 will not be available for such telescoping use if the isolates in them have to be formed by alphabetical device.

8272 So also, the sectors of zone 4 will not be available if the isolates in them have to be formed by subject device.

828 Polishing Work

The schedules in section 7 are only a first draft. They need polishing up so as to secure conformity to the Canons of Consistent Sequence and of Scheduled Mnemonics, to the extent possible without violence to the Canon of Helpful Sequence which is paramount. The resulting class numbers and their sequence should be tested, by classifying a large number of varied documents, both macro and micro, in the fields of pure and applied management. The schedule should be finalised in the light of the experience thus gained. The schedule should also be suitably adapted to classify Public Administration and the Management of other enterprises and institutions, such as Home Management, Hotel Management, School Management, University Management, Library Management, and Hospital Management. This will give sufficient work for a few research students. There can be no shorter route to a stable and enduring schedule for the classification of documents in management, which is a subject in which a considerable turbulance has been taking place since World War II. This turbulance is bound to continue, in our attempt to organise our work economically to feed, house, and clothe the ever-increasing population of the world.

91 INDEX TO SCHEDULE

Note 1:- In the case of an Energy Isolate, the symbol [E] precedes the Isolate Number.

2:- In the case of a Matter Isolate, the symbol [M] precedes the Isolate Number.

3:- In the case of a Personality Isolate, the symbol [P] does not precede the Isolate Number. But it must be understood. Since most of the isolates are Personality Isolates, the symbol [P] is omitted for economy.

4:- If an indented word begins with a lower case latter, it is a continuation word in a phase beginning with the leading word before the indention. For example,

Actual
 labour
  cost K9V22 means that K9V22 is the isolate number for the personality isolate "Actual labour cost"

5:- If an indented word begins with a capital letter, it is a subheading got by Chain Procedure. For example,

Accident-prevention
 bonus
  Dispute Y79C3593 means that Y79C3593 is the isolate number of the personality isolate "Dispute (about) accident-prevention bonus"

6:- If an indented word begins with a capital letter and it is followed by a dash, it is got by the inversion of the words in a phrase. For example,

Accounts
 Consolidated -
  Audit J9ZY means that J9ZY is the isolate number of the personality facet "Audit (of) Consolidated accounts".

Abnormal. Employee YP
Abrasive 9EB
Absenteeism Y564
 Dispute Y79C564
Absorption. Overhead cost K9X
Accelerating premium plan Y356
 Dispute Y79C356
Accident-prevention Y42
 bonus Y3593
  Dispute Y79C3593
 Dispute Y79C42
 Safety measures 9XK
Accounts F
 and finance C
 Committee 67
 Consolidated -
  Audit J9ZY
  Book-keeping GZY
 Cost - K
 Statutory -
  Audit J9T
  Book-keeping GT
Accrued liability DE1
 Accountancy HWE1
 Audit JWE1
Actual
 labour
  cost
   Recovery basis
    Overhead K9V22
  hour
   Recovery basis
    Overhead K9V26
 machine hour
  Recovery basis
    Overhead K9V32

Actual. Material cost *—Contd*
  Recovery basis
   Overhead K9V12
Ad hoc. Buying 9U41
Addressing. Mail M25
Adjudication Y77
Adjustment
 Book-keeping G7
 Cost accounts K7
Administrator Y9V
Adolescent. Employee YC
 Female. Employee YF2
Adult. Employee YD
 Female. Employee YF3
Advertisement B3
 Accountancy HL3
 Audit JL3
After-production
 Advertisement B362
After-sale-service B24
Agenda M62
 Amended - M625
 Committee 61
Agent. Distribution B57
Agreement. Collective Y72
Air-conditioning 9XD8
Air-lift B4413
Alien. Employee YK5
Allocation
 Cost account K5
 Finance D7
Allowance
 time
  Operational instruction 9P362
   Assembly 9P532
   Subassembly 9P432

Allowance *—Contd*
 Wage Y397
  Dispute Y79C397
Alluminium
 Plant engineering 9X9F
Amendment. Agenda M624
Analysis [E] 3
Annual report. Committee 691
Application form Y521
Appointment bureaux Y921
Appreciation D93
Approval .. Budget E3
Arab. Employee YR3P28
Arbitration Y76
Arbor 9ES
Archives
 Office management M98
Aristocracy
 Employee YK2
Arrangement
 Archives M985
 Files M85
Aryan. Employee YR3P1
Assembling
 Accountancy H1
 Audit J1
 Book-keeping G1
 Cost account K1
Assembly
 Production plan 9P5
Assets
 Current DH
  Accountancy HWH
  Audit JWH
 Fictitious - DG4
  Accountancy HWG4

- Assets. Fictitious *–Contd*
  - Audit JWG4
  - Fixed - DG
    - Accountancy HWG
    - Audit JWG
  - Intangible - DG2
    - Accountancy HWG2
    - Audit JWG2
  - Liquid - DK
    - Accountancy HWK
    - Audit JWK
  - Tangible - DG1
    - Accountancy HWG1
    - Audit JWG1
  - Working - DJ
    - Accountancy HWJ
    - Audit JWJ
- Atomic
  - Power 9HY
  - Transport equipment 9FY
- Audience
  - Advertisement B37
- Audit J
- Authority [E] 25
- Authorship royalty account
  - Payable -
    - Audit J9H2
    - Book-keeping GH2
  - Receivable -
    - Audit J9P2
    - Book-keeping GP2
- Automation 9G
- Auxiliary department account
  - Accounts HR
  - Audit JR
  - Budget ER
- Auxiliary services
  - Incentive plan
    - Dispute Y79C3595
    - Incentive plan Y3595
- Average
  - Material cost K9K2
- Away-from-work
  - Instructional 9M755
  - Personal 9M776

- Balance
  - from profit
    - Accountancy HXR5
    - Audit JXR5
    - Finance DR5
  - sheet
    - Accountancy HW
    - Audit JW
    - Budget EW
    - Estimated - EW
- Barth plan Y354B
- Base-stock
  - Material cost K9K5
- Base-rate. Wage Y31
- Base-time 9M61
  - Operational instruction 9P361
    - Assembly 9P561
    - Sub-assembly 9P461
- Basic
  - Budget E9B
  - Standard cost K9F2
- Batch production 9Z4
- Beam.
  - Plant engineering 9XB61
- Bedaux plan Y354BE
- Benefit. Social - Y585
- Bills
  - Book-keeping G9C
- Bills *–Contd*
  - payable
    - Audit J9B1
    - Book-keeping GB1
  - receivable
    - Audit J9B2
    - Book-keeping GB2
  - register
    - Audit J9B
    - Book-keeping GB
- Black-board
  - Meeting room M633
- Black-listing Y79W
- Blanket
  - order 9U48
  - rate
    - Recovery basis
      - Overhead K9V4
- Blanking tool 9EC
- Blind. Employee YP8
- Board. Top-management 2
- Boat
  - Transport
    - Distribution B44121
- Bonus
  - Commission - Y35951
    - Dispute Y79C35951
  - Profit - Y35952
    - Dispute Y79C35952
  - shares DC3
    - Accountancy HWC3
    - Audit JWC3
  - Waste - Y3592
    - Dispute Y79C3592
- Book-cost K9G
- Book-keeping G
- Books
  - Audit J9A
  - Book-keeping GA
- Book-value D97
- Borrowed capital DE
  - Accountancy HWE
  - Audit JWE
- Bound book
  - Book-keeping G931
  - Cost account K931
- Boycot Y79N
- Break-even-point [M]26
- Bribery 9U274
- Budget E
- Building
  - Assets DG12
    - Accountancy HWG12
    - Audit JWG12
  - Committee 63
  - Plant engineering 9XB
- Buying method 9U4
- Bye-product 9B6

- Cadre strength Y191
- Calculation
  - Accountancy H3
  - Audit G3
  - Book-keeping G3
  - Cost account K3
- Call-off. Strike Y781
- Camera-method
  - Duplication M947
- Capacity
  - Automation 9G2
  - Lay-out 9L2
  - Location 9K2
  - Machinery 9D2
  - Material handling equipment 9F2
  - Power 9H2
- Capital
  - Borrowed - DE
    - Accountancy HWE
    - Audit JWE
  - Circulating - DH
    - Accountancy HWH
    - Audit JWH
  - expense account
    - Accountancy HJ
    - Audit JJ
    - Budget EJ
  - Fixed - DG
    - Accountancy HWG
    - Audit JWG
  - General reserve DD1
    - Accountancy HWDD1
    - Audit JWDD1
  - Issued - DC
    - Accountancy HWC
    - Audit JWC
  - Owners' DC4
    - Accountancy HWC4
    - Audit JWC4
  - Preference shares DC21
    - Accountancy HWC21
    - Audit JWC21
- Card
  - Book-keeping G933
  - Cost account K933
- Cart
  - Transport
    - Distribution B44112
- Cash
  - and cheques received book
    - Audit J9X
      - Book-keeping GX
  - book
    - Audit J9U
    - Book-keeping GU
    - General -
      - Audit J9V
      - Book-keeping GV
  - budget ES
    - Accountancy HS
    - Audit JS
  - payment book
    - Audit J9W6
    - Book-keeping GW6
  - received book
    - Audit J9X6
    - Book-keeping GX6
  - Working assets DK6
    - Accountancy HWK6
    - Audit JWK6
- Casual. Employee YG8
- Celebration volume
  - Public relation N27
- Celtic. Employee YR3P18
- Centenary volume
  - Public relation N27
- Centralisation E 22
- Centralised
  - Inspection 9S95
  - Lay-out 9L3
  - Location 9K3
- Ceramic work
  - Plant engineering 9X9N
- Certification. Audit J7
- Change
  - Lay-out 9L95
  - Location 9K5
  - Machinery 9D5
  - Material handling equipment 9F5
  - Plant engineering 9X5
  - Power 9H5

Channel of distribution B5
Chart
  Accountancy H914
  Budget E914
  [M] 3
Chasing
  Book-keeping G917
  Production control 9Q7
  Purchase 9U7
Cheque
  Book-keeping G9G
  payment book
    Audit J9W2
    Book-keeping GW2
  received book
    Audit J9X2
    Book-keeping GX2
Chief executive 7
Child
  Employee YB
    Female. Employee YF1
Cinema
  Advertisement B314
  Public relation N94
Circulating capital DH
  Accountancy HWH
  Audit JWH
Circulation. Minutes M653
City. Employee YH5
Civic duties
  Leave Y5632
Class symbol..Store 9V95
Classification
  Archives M981
  Budget E923
  Files M81
Cleanliness
  Plant engineering 9X2
Cleaning
  Delay 9M715
Code symbol
  Accountancy H924
  Book-keeping G924
  Budget E924
  Cost accounts K924
Collective agreement Y72
ommencement
  Production plan 9P61
Commission bonus Y35951
  Dispute Y79C35951
Committee
  of executives 91
  top-management 6
  work M6
ommon drive
  Automation 9G62
  Machinery 9D62
  Material handling equipment 9F62
ommunication
  Committee work M66
  Plant engineering 9XR3
  work
    Office management M3
omplaint disposal N4
ompletion
  Production plan 9P68
omponent
  Assembly 9P51
  Subassembly 9P41
  Working assets DJ23
    Audit JWJ23
    Accountancy HWJ23
omposition
  Advertisement B322
mpressed air 9XD8

Compulsory
  Arbitration Y765
  Labour YN5
Conciliation Y74
Concrete work
  Plant engineering 9X9J
Concurrent audit J(ZB)
Conduit
  Plant engineering 9XF7
Consolidated accounts
  Audit J9ZY
  Book-keeping GZY
Contact method
  Duplication M946
Constant sharing plan Y354H
  Dispute Y79C354H
Constraint
  Labour YN3
Construction
  Plant engineering 9X6
  Tool 9E2
Consumer Board B281
Container
  Material control 9TS
  Purchase 9US
  Store 9VS
Continuous shift Y5523
Continuity
  Advertisement B363
Contract
  Appointment Y5923
Contributory
  Pension Y5817
    Dispute Y79C5817
  Provident fund Y5827
    Dispute Y79C5827
Control
  Budget E8
  [E] 8
  Finance D8
  Material - 9T
  Production - 9Q
  room
    Plant engineering 9XP6
  Span of - [E] 28
Conversion
  Accountancy H5
Coolant 9E5
Co-ordination [E] 5
Copper work
  Plant engineering 9X9G
Corporation account
  Accountancy HP
  Audit JP
  Budget EP
Correction
  Budget E86
  Finance D86
Correspondence M4
Corrosion
  Store 9V42
Cost
  account K
  Actual -
    Labour
      Recovery basis
        Overhead K9V22
    Material
      Recovery basis
        Overhead K9V12
  Book - K9G
  Blanket rate
    Recovery basis
      Overhead K9V4

Cost centre —*Contd*
    Recovery basis
      Overhead K9V6
  centre rate
    Recovery basis
      Overhead K9V61
  Cost centre hourly cost
    Recovery basis
      Overhead K9V65
  Cost centre rate
    Recovery basis
      Overhead K9V62
  Labour
    Recovery basis
      Overhead K9V2
  Marginal - K9H1
  Material -
    Prime cost K9J
    Recovery basis
      Overhead K9V1
  Normal rate
    Recovery basis
      Overhead K9V71
  Overhead - K9M
  Prime - K9J
    Recovery basis
      Overhead K9V91
  Supplementary rate
    Recovery basis
      Overhead K9V8
Country
  Employers' union Y7Q
  Location 9KC
  Trade union Y7G
Coupon
  Sales promotion B262
Covering
  Roof
    Plant engineering 9XB63
Craft
  County
    Employers' union Y7Q3
    Trade union Y7G3
  District
    Employers' union Y7Q3
    Trade union Y7G3
  Employers' union Y7N3
  International
    Employers' union Y7V3
    Trade union Y7M3
  Local
    Employers' union Y7P3
    Trade union Y7F3
  National
    Employers' union Y7T3
    Trade union Y7K3
  Plant
    Trade union Y7E3
  Regional
    Employers' union Y7S3
    Trade union Y7J3
  State
    Employers' union Y7R3
    Trade union Y7D3
  Zonal
    Employers' union Y7U3
    Trade union Y7L3
Crane structure
  Plant engineering 9XF3
Creative worker Y9K
Credit union Y663
  Dispute Y79C663
Creditor DE7
  Accountancy HWE7
  Audit JWE7

Cripple .. Employee YP41
Cumulative preference shares DC25
  Accountancy HWC25
  Audit JWC25
Current
  assets DH
    Accountancy HWH
    Audit JWH
  budget E9C
Customer
  Organisation [E] 2K
Cutting
  Office work M962
  oil
    Material control 9TJ3
    Purchase 9UJ3
    Store 9VJ3
  speed 9P34
    Assembly 9P534
    Sub-assembly 9P434
  Tool 9EF
Cut-out 9XQ4
Cycle
  Transport
    Distribution B441125

Dance
  Employee services Y674
Danger point
  Inventory turn-over 9T54
Deaf
  and dumb. Employee YP7
  Employee YP5
Debenture DE5
  Accountancy HWE5
  Audit JWE5
Debtor
  Liquid assets DK5
    Accountancy HWK5
    Audit JWK5
Deferred shares DC12
  Accountancy HWC12
  Audit JWC12
Delay
  Acoidable
    Therblig 9M391
  Balance
    Therblig 9M392
  Time-study 9M7
  Unavoidable -
    Therblig 9M38
Delegation [E] 23
Demand
  Finance D1
  Market research B11
Demonstration
  Sales promotion B217
Demotion Y534
  Dispute Y79C534
Department
  Recovery basis
    Overhead K9V5
  Top-management 8
Departmental
  hourly cost
    Recovery basis
      Overhead K9V55
  rate
    Recovery basis
      Overhead K9V51
Depreciation D94
Design
  Tool 9E1
  Working conditions 9M9MB
Despatch 8Q1
Destruction
  Archives M988
Destructive inspection 9S7
Development 9ZB
  Cost account KU
Diagram [M] 5
Dictation
  Correspondence work M91
Dietary advice Y647
Differential
  incentive plan Y351
    Dispute Y79C351
  Piece-rate plan Y353
    Dispute Y79C353
  price B61
  rate
    Wage Y32
      Dispute Y79C32
Digesting
  Correspondence work M41
Dimension
  Product analysis 9P1
Direct distribution B51
Direct-to-money-method
  Job-rating Y166
    Dispute Y79C166
Directing
  Therblig 9M393
Disabled
  Employee YP4
Disability
  Benefit Y58544
    Dispute Y79C58544
  Insurance Y58544
    Dispute Y79C58844
Discipline Y54
  Dispute Y79C44
Discontinuity
  Advertisement B364
Discount. Price B62
Disease prevention Y44
  Dispute Y79C44
Dismissal Y574
  Dispute Y79C574
Dispute Y79C
Distribution B
  Mail M18
Distributor B56
District
  Employers' union Y7Q
  Trade union Y7G
Dividend DR7
  Accountancy MXR7
  Audit JXR7
Documents
  Book-keeping G9A
Door
  Plant engineering 9XB8
Double
  entry G(2)
  product 9B2
  shift Y5522
    Dispute Y79C5522
Draft minutes M651
Drafting M44
Drain
  Plant engineering 9XF2
Drainage connection 9XC2
Drawing
  Working conditions 9MC
Drilling
  Tool 9ED
Drive
  Automation 9G6
  Machinery 9D6
Drive *–Contd*
  Material handling equipment 9F6
Dumb
  Employee YP6
Duplication M94
Duration
  Work study 9MV
Dust
  Store 9V43

Early stop 9M778
Earnings Y392
Earthwork
  Plant engineering 9X9B
Educational institution
  Public relation NF
Effective time 9M65
Efficiency
  Inspection 9S5
Efflux of time
  Retirement Y5716
  Dispute Y79C5716
Effort
  Job characteristic Y143
  Dispute Y79C143
Electricity
  Accident prevention Y42
    Dispute Y79C42
  Equipment 9XN
  Power 9HW
  Transport 9FW
Electronic control 9X55
Emerson plan Y355
Emigrant
  Employee YJ5
Empiric plan. Wage Y355
  Dispute Y79C355
Employee
  Industrial relation Y7B
  record Y528
    Dispute Y79C528
  services Y6
    Dispute Y79C6
Employer
  Industrial relation Y7N
  Method in strike Y79R
  Union Y7N
Employment Y5
  Dispute Y79C5
  exchange Y922
Endowment funds DC7
  Accountancy HWC7
  Audit JWC7
Endurance
  Inspection 9S6
Equipment
  Organisation [E] 2E
  Plant engineering 9XS
  Responsibility for - Y1452
    Dispute Y79C1452

Error
  Audit J41
Estimated
  balance sheet
    Accountancy HW
    Audit JW
    Budget EW
  profit and loss account
    Accountancy HX
    Audit HX
    Budget EX
Evaporation
  Store 9V44
Execution 9R

- Executive
  - account
    - Accountancy HN
    - Audit JN
    - Budget EN
  - Chief - 7
  - Committee of - 91
- Exhibition
  - Sales promotion B212
- Expenditure DP
  - Accountancy HK
  - and income DN
    - Accountancy HXN
    - Audit JXN
    - cost account K9B
  - Audit JK
  - Budget EK
  - Cost account K9C
- Extinguisher
  - Plant engineering 9XH1
- Extra-financial plan Y35
  - Dispute Y79C35

- Factory
  - Delay 9M75
  - engineering 9X
  - supplies
    - Material control 9TJ
    - Purchase 9UJ
    - Store 9VJ
  - surplus DR1
    - Accountancy HXR1
    - Audit JXR1
- Family
  - Pension Y5812
    - Dispute Y79C5812
  - Workman's compensation Y5832
    - Dispute Y79C5832
- Fatigue study 9M4
- Female
  - Employee YF
  - with children. Employee YF7
- Fence
  - Plant engineering 9XE6
- Festival
  - Employee services Y677
    - Dispute Y79C677
- Fictitious assets DG4
  - Accountancy HWG4
  - Audit JWG4
- Field. Inspection 9S91
- Filing work M8
- Film. Sales promotion B227
- Final
  - Minutes M655
  - profit DR5
    - Accountancy HXR5
    - after adjustment DR6
      - Accountancy HXR6
      - Audit JXR6
    - Audit JXR5
  - solution [E] 7
- Finalising
  - Correspondence M45
- Finance D
  - and accounts C
  - Committee 66
  - Employee service Y66
    - Dispute Y79C66
  - Expense budget EM
    - Accountancy HM
    - Audit JM
  - programme ET
    - Accountancy HT
    - Audit JT
- Finance. Training expenses Y616
  - Dispute Y79C616
- Finished product
  - Working assets DJ1
    - Accountancy HWJ1
    - Audit JWJ1
- Fire
  - fighting equipment 9XH
  - prevention Y43
    - Dispute Y79C43
  - protection. Store 9V41
  - Tool 9EK
- First
  - aid Y46
    - Dispute Y79C46
  - vice-president 2, 21
- First-in-first-out K9K1
- Fixed
  - assets DG
    - Accountancy HWG
    - Audit JWG
  - budget E9M
  - liabilities DE3
    - Accountancy HEE3
    - Audit JWE3
  - Overhead K9U2
  - path
    - Horizontal
      - and vertical transport 9FF1
      - transport 9FD1
    - Vertical transport 9FE1
- Fixture 9EP
- Flair
  - Sales promotion B211
- Flexible budget E9N
- Floor
  - Lay-out 9L5
  - marking. Plant engineering 9XK2
  - Plant engineering 9XB2
- Follow-up
  - Safety measures Y47
- Food
  - Delay 9M773
  - In-plant - Y63
    - Dispute Y79C63
- Forecasting
  - Budget B1
  - Sale B111
- Forced labour YN4
- Foreign
  - Distribution B485
  - public
    - Public relation ND5
  - visitor
    - Public relation NC5
- Foreman
  - Grade Y9G
  - Incentive Y35945
    - Dispute Y79C35945
- Form. Budget E91
- Forms and registers M7
- Formula [M] 1
- Formulation [E] 8
- Forward buying 9U42
- Foundation
  - Plant engineering 9XB1
- Founders' shares DC11
  - Accountancy HWC11
  - Audit JWC11
- Franking M26
- Fraud. Audit J45
- Full employment Y915
- Function [E] 3
  - Inspection 9S4
  - Organisation [E] 2M
- Furnace 9XV
  - Equipment 9XR34
- Furniture
  - Assets DG15
    - Accountancy HWG15
    - Audit JWG15
  - Working conditions 9MJ

- Game
  - Indoor. Social services Y676
  - Outdoor. Social services Y675
- Gantt plan Y352G
- Gas. Service connection 9XC3
- Gauge 9EX
  - Plant engineering 9XS2
- General
  - body. Top-management 3
  - County
    - Employers' union Y7Q1
    - Trade union Y7G1
  - District
    - Employers' union Y7Q1
    - Trade union Y7G1
  - Employers' union Y7N1
  - International
    - Employers' union Y7V1
    - Trade union Y7M1
  - Local
    - Employers' union Y7P1
    - Trade union Y7F1
  - National
    - Employers' union Y7T1
    - Trade union Y7K1
  - Plant. Trade union Y7E1
  - Regional
    - Employers' union Y7S1
    - Trade union Y7J1
  - reserve fund DD
    - Accountancy HWD
    - Audit JWD
  - State
    - Employers' union Y7R1
    - Trade union Y7H1
  - Strike Y79E
  - Trade union Y7D1
  - Zonal
    - Employers' union Y7U1
    - Trade union Y7L1
- Generator
  - Plant engineering 9XP1
- Gift
  - Purchase 9U274
  - Sales promotion B261
- Glass-work
  - Plant engineering 9X9M
- Good-will DG21
- Go-slow. Strike Y79L
- Government
  - Industrial relation Y7W
- Graph
  - Accountancy H913
  - Budget E913
  - " [M] 2
- Graphic method
  - Sales promotion B22
- Grasp
  - Therblig 9M34
- Gratuity Y395
  - Dispute Y79C395
- Gravity
  - Transport equipment 9FP
- Grievance Y79B
- Gross
  - profit DR3
    - Accountancy HXR3

- Gross. Profit. Audit JXR3
    - quantity
        - Material analysis 9P255
    - trading profit DR2
        - Accountancy HXR2
        - Audit JXR2
- Group
    - Incentive plan Y358
        - Dispute Y79C358
    - method
        - Sales promotion B28
    - purchase 9U47
- Guarantee
    - Sales promotion B25
- Guard
    - Plant engineering 9XK1
- Gypsy. Employee YR33

- Halsey plan Y354H
- Hammer. Tool 9EH
- Hand tool
    - Safety measure Y421
        - Dispute Y79C421
- Handless. Employee YP43
- Heat
    - Safety measures Y424
        - Dispute Y79C424
    - treatment. Equipment 9XV5
    - working conditions 9MQ
        - Plant engineering 9XD4
- High
    - paid. Employee YM1
    - piece-rate plan Y352
        - Dispute Y79C352
- Hindu. Employee YR3Q2
- Hire-purchase 9U46
- History of enterprise
    - Public relation N26
- Hold. Therblig 9M36
- Holiday
    - Service conditions Y56
        - Dispute Y79C56
    - Shift. Wage Y321
        - Dispute Y79C321
- Honorary. Employee YL
- Horizontal
    - and vertical transport equipment 9FF
    - headings
        - Accountancy H923
        - Budget E923
        - Book-keeping G923
        - Cost account K923
    - transport equipment 9FD
- Hose. Plant engineering 9XH3
- Hospital service Y664
    - Dispute Y79C644
- Hours
    - Blank rate
        - Recovery basis
            - Overhead K9V45
    - Cost centre hourly rate
        - Recovery basis
            - Overhead K9V65
    - Cost centre rate
        - Recovery basis
            - Overhead K9V63
    - Departmental rate
        - Recovery basis
            - Overhead K9V53
    - Machine
        - Recovery basis
            - Overhead K9V3
    - Normal rate
        - Recovery basis
            - Overhead K9V75
- Hours. Supplementary rate
    - Recovery basis
        - Overhead K9V85
    - Work - Y55
        - Dispute Y79C55
- House magazine
    - Public relation N23
- Housing
    - Employee services Y62
        - Dispute Y79C62
- Humidity
    - Store 9V45
    - Working conditions 9MR
        - Plant engineering 9XD45
- Hydrant
    - Plant engineering 9XH2
- Hydraulic
    - machinery
        - Safety measures Y423
            - Dispute Y79C423
    - Power 9HS
    - Transport equipment 9FS

- Ideal
    - Standard cost K951
- Idle machine 9Q34
- Illuminated sign
    - Advertisement B3125
    - Public relation N925
- Imbecile. Employee YP2
- Immigrant. Employee YJ6
- Incentive plan Y35
    - Dispute Y79C35
- Income D3
    - Cost account K9D
- Increasing. Finance D3
- Indent
    - Analysis 9U1
    - Grouping 9U1
    - Material control 9T2
- Indexing
    - Archives M982
    - Files M82
- Indian. Employee YRP15
- Indirect production plan
    - Incentive plan Y3594
        - Dispute Y79C3594
- Indentured. Employee YM93
- Individual drive
    - Automation 9G61
    - Machinery 9D61
    - Material handling equipment 9F61
- Indoor game.
    - Employee services Y676
- Induction
    - Personnel management Y524
- Industrial relation Y7
- Industry
    - County
        - Employers' union Y7Q2
        - Trade union Y7G2
    - District
        - Employers' union Y7Q2
        - Trade union Y7G2
    - Employers' union Y7N2
    - International
        - Employers' union Y7V2
        - Trade union Y7M2
    - Local
        - Employers' union Y7P2
        - Trade union Y7F2
    - National
        - Employers' union Y7T2
        - Trade union Y7K2
    - Plant. Trade union Y7E2
- Industry. Regional
    - Employers' union Y7S2
    - Trade union Y7J2
    - State
        - Employers' union Y7R2
        - Trade union Y7H2
    - Trade union Y7D2
    - Zonal
        - Employers' union Y7U2
        - Trade union Y7L2
- Inflated cost
    - Material. Prime cost K9K4
- Injury
    - Benefit Y58547
        - Dispute Y79C58547
    - Insurance Y8847
        - Dispute Y79C58847
- Inland. Distribution B482
- Insect. Store 9V48
- Inspection 9S
    - Delay 9M717
    - Incentive Y35946
    - Material control 9T4
    - Plant engineering 9X1
    - Therblig 9M394
- Instrument [M] 8
- Installation
    - Plant engineering 9X6
- Interference by employer Y79S
- International
    - Employers' union Y7V
    - Government
        - Industrial relation Y7Z
    - Trade union Y7M
- Interview Y522
- Instruction. Delay 9M754
- Insurance
    - Audit J9F
    - Book-keeping GF
    - Social Y588
        - Dispute Y79C588
- Interest
    - Overhead cost K9S
    - Payable -
        - Audit J9L
        - Book-keeping GL
    - Receivable -
        - Audit J9R
        - Book-keeping GR
- Inventory turnover 9T5
- Investigation
    - Audit J5
    - Safety measures Y48
        - Dispute Y79C48
- Investment
    - Finance D5
    - Working assets DK5
        - Accountancy HW5
        - Audit JWK5
- Invoice
    - Book-keeping G9B
    - Purchase 9U8
- Inward mail M1
- Issue work
    - Archives M986
    - Files M86
    - Store 9V6
    - Tool 9E6
- Issued capital DC
    - Accountancy HWC
    - Audit JWC

- Janitor supplies
    - Material control 9TR
    - Purchase 9UR

- Janitor supplies. Store 9VR
- Jew. Employee YR3Q5
- Jig 9EN
- Job
  - analysis 9M11
  - characteristics Y14
  - classification Y15
    - Dispute Y79C15
  - evaluation Y1
  - rating Y16
    - Dispute Y79C15
  - review Y11
  - specification Y12
- Jubilee volume
  - Public relation N27

- Kannadiga. Employee YR3P33
- Key operation
  - Inspection 9S3

- Laboratory scale 9ZC
  - Cost account KV
- Labour
  - Accountancy HF
  - Agency Y92
  - Budget EF
  - cost.
    - Recovery basis
      - Overhead K9V2
  - grade Y9A
  - market Y91
  - Prime cost K9L
  - Source Y51
- Ladder
  - Plant engineering 9XH7
- Lame. Employee YP42
- Land. Assets DG11
  - Accountancy HWG11
  - Audit JWG11
- Landscape
  - Plant engineering 9XE1
- Last-in-first-out K9K6
- Late beginning. Delay 9M771
- Lateness Y5641
- Lay-out engineering 9L
- Leaflet
  - Advertisement B311
  - Public relation N91
- Leather-work
  - Plant engineering 9X9S
- Leave
  - for training Y615
  - Service conditions Y562
    - Dispute Y79C562
- Legal help
  - Employee services Y68
- Legends
  - Advertisement B32
  - Accountancy H921
  - Book-keeping G921
  - Budget E921
  - Cost account K921
- Leisured class. Employee YL
- Liabilities DE
  - Accountancy HWE
  - Audit JWE
- Library
  - Employee services Y672
- Light
  - Equipment
    - Plant engineering 9XR35
    - Meeting room M635
    - Plant engineering 9XD5
    - Work conditions 9MS
        - Plant engineering 9XD5
- Lightning protection 9XQ96
- Line and staff [E] 2S
- Liquid assets DK
  - Accountancy HWK
  - Audit JWK
- Loan
  - Employee services Y665
  - Liabilities DE7
    - Accountancy HWE7
    - Audit JWE7
- Local
  - Distribution B481
  - Employee YJ1
  - Employers' union Y7P
  - Public. Public relations ND1
  - Trade union Y7F
  - Visitor
    - Public relations NC1
- Location
  - Engineering 9K
  - Organisation [E] 2B
- Lock-out Y79W
- Long-term liabilities DE3
  - Accountancy HWE3
  - Audit JWE3
- Loose-leaf
  - Book-keeping G932
  - Cost account K932
- Loss. Fictitious assets DG42
  - Accountancy HWG42
  - Audit JWG42
- Lot-size
  - Purchase 9Y5
  - Store 9V5
- Low-paid. Employee YM8
- Lubricating oil
  - Material control 9TJ2
  - Purchase 9UJ2
  - Store 9VJ2

- Machinery
  - Committee 64
  - Delay 9M752
  - Fixed assets DG13
    - Accountancy HWG13
    - Audit JWG13
  - Idle - 9Q34
  - Lay-out 9LJ
  - Load
    - Operation instructions 9P31
      - Assembly 9P531
      - Sub-assembly 9P431
    - Production control 9Q3
  - Material control 9TD
  - Purchase 9UD
  - Safety measures Y422
    - Dispute Y79C422
  - Standards engineering 9D
  - Store 9VD
  - Working conditions 9MD
- Mail
  - Inward - M1
  - Outward - M2
- Mailing M28
- Maintenance
  - Plant engineering 9X3
  - Price B65
  - work. Incentive plan V35941
- Malayalee
  - Employee YR3P32
- Management
  - [E] 8
    - (Main class) (X)
    - Top - - 1
- Mandrel 9EQ
- Manual worker Y9B
- Manufacturing
  - budget EC
    - Accountancy HC
    - Audit JC
  - expense budget EG
    - Accountancy HG
    - Audit JG
- Manufactured part
  - Material control 9TCE
  - Purchase 9UCE
  - Store 9VCE
- Marginal cost K9H1
- Market
  - Committee 65
  - research B1
  - value
    - Recovery basis
      - Overhead K9V92
- Marriage
  - Resignation for - Y5725
    - Dispute Y79C5725
- Married female
  - Employee YF5
- Masonary
  - Plant engineering 9X9C
- Mass-production 9Z5
- Master budget EZY
  - Accountancy HZY
  - Audit JZY
- Matching documents
  - Accountancy H2
  - Audit J2
  - Book-keeping G2
  - Cost account K2
  - Inward mail M17
  - Outward mail M27
- Material
  - Analysis 9P2
    - Assembly 9P52
    - Sub-assembly 9P42
  - Budget EE
    - Accountancy HXE
    - Audit JXE
  - Construction -
    - Material control 9TK
    - Purchase 9UK
    - Store 9VK
  - Control 9T
  - Cost
    - Recovery basis
      - Overhead K9V1
  - Current assets DJ3
    - Accountancy HWJ3
    - Audit JWJ3
  - Delay 9M751
  - feed
    - Production control 9Q2
  - handling
    - equipment 9F
      - Material control 9TF
      - Purchase 9UF
      - Store 9VF
    - Incentive plan Y35943
      - Dispute Y79C35943
  - Personnel division
    - Material control 9TW
    - Purchase 9UW
    - Store 9VW
  - Plant engineering
    - Material control 9TV
    - Purchase 9UV
    - Store 9VV
  - Prime cost K9K
  - Responsibility for - Y145

Material. Responsibility for
  Dispute Y79C145
Maternity
  Benefit Y5855
  Insurance Y5885
Maximum
  Inventory turn-over 9T51
Mechanical
  Equipment
    Plant engineering 9XT
  Duplication M942
  operations. Office work M96
  Power 9HR
    Transport 9FR
Mediation Y75
Medical
  Insurance Y5884
    Dispute Y79C5884
  Retirement Y5714
    Dispute Y79C5714
  service Y64
    Dispute Y79C64
  Social benefit Y5854
    Dispute Y79C5854
Medium
  Advertisement B31
  Public relations N1
  term. Liabilities DE2
    Accountancy HWE2
    Audit JWE2
Meeting room M63
Mental
  effort Y1434
  fatigue 9M45
  skill Y1414
Merit rating Y2
  Dispute Y79C2
Merrick plan Y353
Metal work. Plant engineering 9X9H
Methods
  Responsibility for - Y1453
    Dispute Y79C1453
Metre. Plant engineering 9XS1
Micro-duplication M948
Micro-motion study 9M13
Middle class. Employee YK3
Military class. Employee YK4
Mineral. Royalty
  payable
    Audit J9H1
    Book-keeping GH1
  Receivable
    Audit J9P1
    Book-keeping GP1
Minimum
  Inventory turn-over 9TS2
Minutes work M65
Mixed. Lay-out 9LM
Model [M] 7
Money
  Forecasting. Budget E16
  Preparation. Budget E26
  Responsibility for - Y1456
    Dispute Y79C1456
Mongolian. Employee YR3P41
Monotony
  Working conditions 9MW
Morale Y71
Motion study 9M1
Motor
  cycle. Transport
    Distribution B441135
  Plant engineering 9XR1
  truck. Transport
    Distribution B441132
Moving poster
  Advertisement B3123
  Public relation N923
Multi-floor. Lay-out 9L55
Multiple product 9B5
Multi-purpose. Form M728
Muscular power
  Transport equipment 9FQ
Music
  Employee services Y673
Muslim. Employee YR3Q7
Mutual benefit fund Y661

Narrative form
  Accountancy - H917
  Budget H917
Negotiation
  Industrial relation Y73
  Purchase 9U35
Net
  profit DR4
    Accountancy HXR4
    Audit JXR4
  Quantity
    Material analysis 9P251
  trading profit DR3
    Accountancy HXR3
    Audit JXR3
  worth DB
    Accountancy HWB
    Audit JWB
New employee
  Induction Y524
  Safety education Y411
Night shift Y5524
  Dispute Y79C5524
  Wage Y322
    Dispute Y79C322
Noise
  Plant engineering 9XD3
  Working conditions 9MP
Nomadic. Employee YR3MY6
Non-contributory
  Pension Y5818
  Provident fund Y5828
Non-cumulative
  Profit shares DC26
    Accountancy HWC26
    Audit JWC26
Non-paid employee YN
Non-participating
  Preference shares DC24
    Accountancy HWC24
    Audit JWC24
Non-redeemable
  Profit shares DC28
    Accountancy HWC28
    Audit JWC28
Nordic. Employee YR3P114
Normal
  rate
    Recovery basis
      Overhead K9V7
  standard cost
    Recovery basis
      Overhead K9F6
Notes-taking
  Committee work M634
Notification. Meeting M61
Noting. Correspondence M43
Nourishment
  Working conditions 9MT
Numbering
  Inward mail M14
  Outward mail M22
Nursing
  Employee services Y643

Obsolescence
  Automation 9G4
  Machinery 9D4
  Material handling equipment 9F4
Offence
  Service conditions Y545
Office
  Management M
  supplies
    Material control 9TQ
    Purchase 9UQ
    Store 9VQ
Oil
  Service connection 9XC5
Oiling
  Plant engineering 9X35
Old
  Employee YE
  female. Employee YF4
One-off
  Production 9Z2
Open day
  Public relation N3
Opener B418
Opening. Mail M12
Operating equipment
  Plant engineering 9XX
Operation
  analysis 9M12
  Automation 9G7
  Delay 9M7
  instruction 9P3
    Assembly 9P53
    Sub-assembly 9P43
  Machinery 9D7
  Material handling equipment 9F7
  sequence 9P37
    Assembly 9P57
    Sub-assembly 9P47
  Tool 9E7
Order
  point
    Material control 9T53
  Purchase 9U6
Ordinary shares DC1
  Accountancy HWC1
  Audit JWC1
Organisation
  in Management [E] 2
  in other subjects [E] 8
  Factors of - [E] 2A
Orientation. Lay-out 9L1
Out-door
  game
    Employee services Y675
  signs
    Plant engineering 9XE7
Outward mail M2
Over-absorption. Overhead K9X2
Over-employment Y912
Overhead
  cost K9M
  transmission equipment 9XQ2
Over-time
  Wage Y323
    Dispute Y79C323
  work Y5512
    Dispute Y79C5512
Owner's capital DC4
  Accountancy HWC4
  Audit JWC4

Package lable. Sales promotion B221
Packaging B42
Pail
  Plant engineering 9XH5
Painting
  Plant engineering 9X34
Papers
  Committee work M67
Paring. Tool 9EE
Parking space
  Plant engineering 9XE4
Partial. Strike Y79F
Participating
  Profit shares DC23
    Accountancy HWC23
    Audit JWC23
Parts
  Manufactured –
    Material control 9TC
  Purchase 9UC
  Purchased –
    Material control 9TCE
  Spare –
    Material control 9TM
  Store 9VC
Part-time
  Employee YG4
  work Y5511
    Dispute Y79C5511
Party pressure Y7A
Passing of bills G5
Pasting
  Office work M968
Patent. Royalty
  Intangible assets DG22
  Payable -
    Audit J9H3
    Book-keeping GH3
  Receivable -
    Audit J9P3
    Book-keeping GP3
Pay
  Leave with - Y5621
  Leave without - Y5623
  roll K9E
Payment
  Advice of - G9E
  book
    Audit JPW
    Book-keeping GW
Penalty
  Service conditions Y546
    Dispute Y79C546
Pension
  Audit J9E
  Book-keeping GE
  Service conditions Y581
    Dispute Y79C581
Pensioner YE6
  Female - YF46
Perforating
  Office work M964
Permanent. Employee YG7
Personal
  Delay 9M77
  influence. Purchase 9U27
Personality
  Job characteristics Y147
Personnel
  Department
    Accountancy HWQ
    Audit JWQ
    Budget EQ
  management Y
    Parties Y7A
Photo-duplication
  Office work M945
Physical
  distribution B4
  effort Y1432
    Dispute Y79C1432
  Fatigue 9M42
  Skill Y1412
  structure
    Book-keeping G93
    Cost-account K93
  verification
    Material control 9T58
Picketing Y79M
Pickling solution
  Material control 9TJ4
  Purchase 9UJ4
  Store 9VJ4
Picture
  Advertisement B325
  Sales promotion B225
Piece-rate Y34
  Dispute Y79C34
Pillar
  Plant engineering 9X45
Pilot scale 9ZD
  Cost account KW
Place. Location engineering 9KE
Plan. Therblig 9M397
Plant
  engineering 9X
  Trade union Y7E
Plastic work
  Plant engineering 9X9P
Pneumatic
  Power 9HT
  Transport equipment 9FT
Policy [E] 1
Policy-maker Y9W
Position. Therblig 9M37
Post-audit J(ZC)
Poster
  Advertisement B312
  Public relation N92
Posting
  Book-keeping G6
  Cost-account K6
  Outward mail M28
Power
  Material control 9TH
  outlet
    Equipment
      Plant engineering 9XO5
  plant
    Equipment
      Plant engineering 9XP
  Purchase 9UH
  Store 9VH
Praise Y547
Preference shares DC2
  Accountancy HWC2
  Audit JWC2
Preferred shares DC13
  Accountancy HWC13
  Audit JWC13
Pregnant. Employee YF6
Preliminary expenses DG41
  Accountancy HWG41
  Audit JWG41
Preliminary solution [E] 4
Premature
  Retirement Y5715
    Dispute Y79C5715
Premium
  plan, Incentive plan Y35
Premium plan –*Contd*
    Dispute Y79C35
  scheme. Sales promotion B26
Preparation. Budget E2
Pre-position
  Therblig 9M33
Pre-production
  Advertisement B361
President
  Top management 2,1
Press
  Medium
    Advertisement B396
    Public relations N96
  Public relation NE
Price
  acceptance 9U3
  Agent B67
  differential B61
  Direct-sale B61
  Distribution B6
  Distributor B66
  list 9U31
  load B16
  Retail - B62
  Wholesale - B65
Primary allocation K51
Prime cost K9J
  Recovery basis
    Overhead K9V91
Primitive. Employee YR2
Prisoner. Employee YQ
Private
  Transport
    Distribution B4427
Process
  analysis 9M11
  Lay-out 9LE
  Organisation [E] 2P
Product
  analysis 9P1
  engineering 9B
  Lay-out 9LC
  Organisation E 2D
Production
  Accountancy HD
  Audit JD
  Budget ED
  control 9Q
  engineering 9N
  management 9A
  planning 9P
  Power 9H31
Profit DR
  Accountancy HXR
  and loss account HX
    Estimated - EX
  Audit JXR
  bonus
    Incentive plan Y35952
      Dispute Y79C35952
  shares DC22
    Accountancy HWC22
    Audit JWC22
  sharing
    Incentive plan Y36
      Dispute Y79C36
Promotion
  Service conditions Y533
    Dispute Y79C533
Protection
  Archives M984
  Files M84
  Store 9V4
Proto-type 9ZE

- Prototype. Cost account KX
- Provident fund Y582
  - Dispute Y79C582
- Provisions. Finance DE6
  - Accountancy HWE6
  - Audit JWE6
- Psychiatric service Y645
- Public
  - relations N
  - Transport
    - Distribution B4425
- Publication
  - Public relations N2
- Punched card
  - Book-keeping G934
  - Cost account K934
- Punching
  - Office work M963
- Purchase 9U
  - Accountancy HH
  - Accounts
    - Audit J9C
    - Book-keeping GC
  - Audit JH
  - Budget EH
  - Source. Power 9H35
- Purchased parts
  - Material control 9TC
- Purpose
  - Forms and registers M72

- Quality
  - control 9Q5
  - Demand B112
  - Material analysis 9P23
  - Product analysis 9P13
  - premium incentive plan Y3591
- Quantity
  - Budget
    - Forecasting E11
    - Preparation E21
  - control 9Q8
  - Demand B111
  - Material analysis 9P25
  - Product analysis 9P15
- Quotation. Purchase 9U32

- Race. Employee YR
- Radiation
  - Safety measures Y425
    - Dispute Y79C425
- Radio
  - Advertisement B313
  - Public relation N93
- Rafter
  - Plant engineering 9XB62
- Rail-track
  - Plant engineering 9XF4
- Railing
  - Production engineering 9XK1
- Railway
  - Transport
    - Distribution B44115
- Raising
  - Finance D2
- Rate-differential. Wage Y32
  - Dispute Y79C32
- Rates account
  - Audit J9G
  - Book-keeping GG
- Ratio-form
  - Accountancy H112
  - Budget E912
- Real wage Y391
  - Dispute Y79C391
- Receipt
  - book
    - Audit J9X
    - Book-keeping GX
  - of payment G9F
- Receiving
  - Mail M11
  - Store 9V1
- Reception
  - Office work M51
- Reciprocity
  - Purchase 9U25
- Reconstruction
  - Plant engineering 9X5
- Recording devices
  - Plant engineering 9XS3
- Records
  - Responsibility for - Y148
    - see also Archives. Files
- Recovery
  - basis. Overhead K9V
  - rate. Overhead K9W
- Recreation
  - Employee services Y67
- Recruitment Y52
  - Dispute Y79C52
- Rectification. Audit J6
- Redeemable
  - Preference shares DC27
    - Accountancy HWC27
    - Audit JWC27
- Reducing. Finance D4
- Refugee. Employee YJ4
- Region
  - Employers' union Y7S
  - Location engineering 9KD
  - Trade union Y7J
- Registering
  - Inward mail M16
  - Outward mail M24
- Registers M7
- Reinforced concrete work 9X9K
- Rejecting
  - Store 9V2
- Relation. Industrial - Y7
- Release load. Therblig 9M35
- Remodelling. Lay-out 9L95
- Rent account
  - Payable
    - Audit J9K
    - Book-keeping GK
  - Receivable
    - Audit J9Q
    - Book-keeping GQ
- Renting 9U45
- Repair
  - Plant engineering 9X4
- Replacement
  - Automation 9G5
  - Machinery 9D5
  - Material handling equipment 9F5
  - Tool 9E4
- Report. Audit J8
- Reporting [E] 8
- Research-worker
  - Employee Y9R
- Reserve fund DD
  - Accountancy HWD
  - Audit JWD
- Resignation Y572
  - Dispute Y79C572
- Responsibility
  - Job evaluation Y145
    - Dispute Y79C145
- Rest period 9M5
- Retail
  - board B282
  - Distribution B56
- Retired. Employee YE1
  - Female. Employee YF41
- Retirement Y571
  - Dispute Y79C571
- Retrenchment Y53
  - Dispute Y79C53
- Return. Store 9V65
- Revenue. Reserve DD2
  - Accountancy HWD
  - Audit JWD
- Review
  - Forms and registers M74
- Revision
  - Budget E4
  - Forms and registers M75
- Road-way
  - Plant engineering 9XE3
- Roof. Plant engineering 9XB6
- Rowan plan Y354R
- Royalty account
  - Payable
    - Audit J9H
    - Book-keeping G9H
  - Receivable
    - Audit J9P
    - Book-keeping GP
- Rubber
  - Plant engineering 9X9S
- Rules
  - Service conditions Y541
    - Dispute Y79C541
- Rural. Employee YH1

- Sabotage Y79P
- Safety
  - equipment
    - Plant engineering 9XG
  - measures Y4
    - Devices
      - Plant engineering 9XK
    - Work-study 9MY
- Salaried. Employee Y9N
- Sales
  - Accountancy HB
  - Audit KB
  - Budget EB
  - promotion B2
- Sanitary condition
  - Plant engineering 9X2
  - Work-study 9MX
- Savings plan
  - Employee services Y662
- Scattered
  - Lay-out 9L4
  - Location 9K4
- Scheduled buying 9U43
- Scheduling
  - Office work M56
  - Production plan 9P6
- Scrap
  - Material analysis 9P253
  - Overhead cost K9N1
- Scratch-value D95
- Sealing. Outward mail M25
- Search. Therblig 9M396
- Seasonal fluctuation
  - Demand B116
  - Employee YG5
- Seating arrangement
  - Meeting M631
- Secret. Reserve DD5
  - Accountancy HWD5

CLASSIFICATION OF MANAGEMENT

- Secret. Audit JWD5
- Second vice-president 2.22
- Secondary allocation K52
- Secretarial work M5
- Secretary
  - Top management 2,8
- Selection
  - Automation 9G1
  - Location 9K1
  - Machinery 9D1
  - Material handling equipment 9F1
  - Power 9H1
  - Staff Y523
    - Dispute Y79C523
  - Therblig 9M395
- Self-owned
  - Transport
    - Distribution B4421
- Selling B7
- Semetic. Employee YR3P2
- Semi-skilled. Employee Y9D
- Semi-variable. Overhead K9U4
- Seniority Y531
- Service-conditions Y5
  - Dispute Y79C5
- Service-connection
  - Plant engineering 9XC
- Setting time 9P33
  - Assembly 9P53
  - Sub-assembly 9P43
- Settlement Y78
- Shares DC
  - Accountancy HWC
  - Audit JWC
- Shareholders
  - Public relation N8
- Sharing
  - Incentive plan Y354
    - Dispute Y79C354
- Sharpening. Tool 9E3
- Shift
  - service conditions Y552
    - Dispute Y79C552
  - Holiday. Wage Y321
    - Dispute Y79C321
  - Night Y322
    - Dispute Y79C322
- Ship
  - Transport
    - Distribution B44125
- Shortage. Overhead K9N4
- Shorthand. Office work M921
- Show-room B213
- Sickness
  - Benefit Y58541
    - Dispute Y79C58541
  - Insurance Y58844
    - Dispute Y79C58844
  - Leave Y5624
    - Dispute Y79C5624
- Signal
  - Plant engineering 9XR31
- Signs
  - Out-door
    - Plant engineering 9XE7
- Simple
  - Material
    - Prime cost K9K21
- Single
  - entry. Book-keeping G(1)
  - Floor 9L51
  - -product 9B1
- Sit-down strike Y79K
- Site 9KF
- Skill Y141
- Skilled. Employee Y9E
- Sky-writing
  - Advertisement B318
  - Public relation N98
- Slav. Employee YR3P14
- Slave. Employee YN2
- Sliding scale. Wage Y311
  - Dispute Y79C311
- Slotting. Tool 9EG
- Social
  - benefit Y585
    - Dispute Y79C585
  - insurance Y588
    - Dispute Y79C588
  - security Y58
    - Dispute Y79C58
- Sorting
  - Inward. Mail M13
  - Outward. Mail M21
- Source
  - Power 9H3
  - Purchase 9U2
- Span of control E 21
- Spare parts
  - Material control 9TM
  - Purchase 9UM
  - Store 9VM
- Special occasions
  - Advertisement B365
- Speculative buying 9U44
- Spoilage. Overhead cost K9N2
- Sprinkler
  - Plant engineering 9XH4
- Stacking. Store 9V3
- Staff
  - Committee 68
  - management Y
- Stairway
  - Plant engineering 9XB5
- Stamping
  - Inward. Mail M15
  - Outward. Mail M23
- Standard
  - Cost K9F
  - Labour
    - cost
      - Recovery basis
        - Overhead K9V21
    - hour
      - Recovery basis
        - Overhead K9V25
  - Machine hour
    - Recovery basis
      - Overhead K9V31
  - Material
    - control 9T1
    - cost
      - Recovery basis
        - Overhead K9V1
    - Prime cost K9K1
    - Order 9T55
  - Productive hour
    - Recovery basis
      - Overhead K9V95
- Standards engineering 9C
- Standing source
  - Purchase 9U2
- State government
  - Industrial relation Y7X
- Statement
  - Accountancy HA
  - Cost account K9A
- Stapling. Office work M965
- Static poster
  - Advertisement B3122
- Static poster. Public relation N922
- Status
  - Service conditions Y53
    - Dispute Y79C53
- Statutory accounts
  - Audit J9T
  - Book-keeping GT
- Stay-in-strike Y79J
- Steam
  - Service connection 9XC4
- Steel work
  - Plant engineering 9X9E
- Stock-ownership
  - Incentive plan Y37
    - Dispute Y79C37
- Store
  - Incentive plan Y35942
    - Dispute Y79C35942
  - Management 9V
- Straight-point-method
  - Job-rating Y161
- Strained relation Y79A
- Strike Y79D
  - breaking Y79T
- Structure
  - Accountancy H92
  - Book-keeping G92
  - Budget E92
  - Cost account K92
- Sub-assembly
  - Production planning 9P4
  - Working assets DJ21
    - Accountancy HWJ21
    - Audit JWJ21
- Sub-contract
  - Production planning 9P65
- Submarine
  - Transport
    - Distribution B441254
- Subsidiary company
  - Accountancy HZ
  - Audit JZ
  - Budget EZ
  - Fixed assets DG18
- Supervision [E] 4
- Supervisor Y9G
- Supplementary rate
  - Recovery basis
    - Overhead K9V8
- Supply. Market research B12
- Sweating Y394
  - Dispute Y79C394
- Sympathetic strike Y79G
- System
  - Audit J(ZA)
  - Book-keeping G(O)

- Table
  - Accountancy H916
  - Budget E916
  - [M] 4
- Take-home-pay Y396
  - Dispute Y79C396
- Talk
  - Advertisement B317
  - Public relation N97
- Talking. Delay 9M772
- Tamilian. Employee YR3P31
- Tandem adjustment Y314
- Tangible assets DG1
  - Accountancy HWG1
  - Audit JWG1
- Tax accounts
  - Audit J9G
  - Book-keeping GG

Technical. Employee Y9T
Telegraph M34
Telephone
  Office management M33
  Plant engineering 9XR33
Teleprint M35
Television
  Advertisement B315
  Public relation N95
Telugu. Employee YR3P35
Template 9EW
  [M] 6
Tender. Purchase 9U33
Termination of work Y57
Test audit J(ZD)
Teutonic. Employee YR3P11
Textile
  Plant engineering 9X9T
Theft. Store 9V47
Therbligs 9M3
Thermal
  Power 9HV
  Transport equipment 9FV
Time
  Advertisement B36
  of day. Working conditions 9MU
  Operational instruction 9P36
    Assembly 9P536
    Sub-assembly 9P436
  rate. Wage Y33
  recording. Production control 9Q6
  study 9M6
Tolerance
  Production analysis 9P12
Tool 9EA
  crib 9E8
  Delay 9M753
  etc 9E
  Feed 9Q4
  making. Incentive plan Y35944
    Dispute Y79C35944
  Material control 9TE
  Operation instruction 9P32
    Assembly 9P52
    Sub-assembly 9P42
  Working conditions 9ME
To-order. Production 9Z2
Top-management 1
Total time
  Operational instruction 9P363
    Assembly 9P563
    Sub-assembly 9P463
Trade
  mark. Intangible assets DG25
  name. Advertisement B23
  union Y7D
Trading profit
  Gross DR2
    Accountancy HXR2
    Audit JXR2
  Net DR3
    Accountancy HXR3
    Audit JXR3
Training facility Y61
  Dispute Y79C61
Tramcar
  Transport
    Distribution B441151
Transfer
  empty. Therblig
  Equipment 9FB
  Files M88
  loaded. Therblig 9M32
  Service conditions Y532
    Dispute Y79C532

Transformer
  Plant engineering 9XP4
Transmission equipment 9XQ
Transport
  Distribution B44
  equipment 9FC
  Employee services Y624
Treasurer's account
  Accountancy HM
  Audit JM
  Budget EM
Treble entry
  Book-keeping G(3)
Trial. Inspection 9S1
Truck. Plant engineering 9XH6
Truss. Plant engineering 9XB61
Trustee body 5
Tunnel. Plant engineering 9XF6
Turnover study
  Personnel management Y591
Typing. Office work M93
Typography
  Advertisement B328

Under
  absorption. Overhead K9X1
  employment Y911
  ground
    transmission equipment 9XQ1
Unemployment Y913
Unit
  Blanket rate
    Recovery basis
      Overhead K9V4
  Cost centre hourly rate
    Recovery basis
      Overhead K9V68
  Cost centre rate
    Recovery basis
      Overhead K9V65
  Departmental hour cost
    Recovery basis
      Overhead K9V58
  Departmental rate
    Recovery basis
      Overhead K9V54
  Normal rate
    Recovery basis
      Overhead K9V77
  Overhead recovery K9V97
  Supplementary rate
    Recovery basis
      Overhead K9V87
Unskilled. Employee Y9C
Unsuccessful strike Y79H
Urban. Employee YH3
Utilisation
  Power. Equipment 9XR
  Waste 9B8

Vagrant. Employee YJ8
Variable
  Overhead K943
  Path
    Horizontal
      and vertical transport 9FF5
      transport 9FD5
    Vertical transport 9FE5
  Sharing plan
    Incentive plan Y354B
Variance
  Budget control E84
  Finance control D84
Vehicle
  Assets DG14

Vehicle. Assets *–Contd*
    Accountancy HWG14
    Audit JWG14
  Material control 9TT
  Plant engineering 9XM
  Purchase 9UT
  Store 9VT
Vendor 9U2
Ventilation 9XD1
Verification
  Accountancy H4
  Audit J4
  Book-keeping G4
  Cost account K4
Vertical file
  Archives M9851
  Files M51
Vibration
  Plant engineering 9XD2
  Working conditions 9MN
Vice-president
  Top-management 2, 2
Visitor
  Public relation NC
Visual methods
  Sales promotion B21
Voluntary arbitration Y761
Voucher G9D
Vouching J2

Wage Y3
  account
    Audit J9D
    Book-keeping GD
  earner. Employee Y9B
Walk-way
  Plant engineering 9XE3
Wall
  Plant engineering 9XB41
Warning signal
  Plant engineering 9XK3
Waste
  bonus plan
    Incentive plan Y3592
  Material
    analysis 9P254
    control 9TJ1
  Purchase 9UJ1
  Store 9VJ1
  Utilisation 9B8
Watchman's equipment 9XJ
Water
  Service connection 9XC1
  tank 9XF1
Weather. Store 9V46
Weighted material cost
  Recovery basis
    Overhead K9K27
Weight-point method
  Job-rating Y163
    Dispute Y79C163
Welfare account
  Accountancy HQ5
  Audit JQ5
  Budget EQ5
Wholesale Board
  Distribution B55
  Sales promotion B285
Widow. Employee YF8
Window
  Plant engineering 9XB7
Wiping rag
  Material control 9TJ1
  Purchase 9UJ1
  Store 9VJ1

- Wood-work
  - Plant engineering 9X9D
- Work
  - flow. Production planning 9P7
  - in-progress
    - Material control 9TN
    - Store 9VN
  - study 9M
- Working
  - assets DJ
- Working assets –*Contd*
    - Accountancy HWJ
    - Audit JWJ
  - conditions
    - Inspection 9S2
    - Plant engineering 9XD
    - Work-study 9MA
  - surplus DR1
    - Accountancy HXR1
    - Audit JXR1
- Workman's compensation Y583
  - Dispute Y79C583
- Yard
  - Plant engineering 9XE
  - structures
    - Plant engineering 9XF
- Zone
  - Employers' union Y7U
  - Location engineering 9KB
  - Trade union Y7L

---

92 Errata and Transfer in Schedule

Page	Column	Line	For	Read
62	2	15	E91	E912
63	2	22	Royalty accounts	Royalth payable account
64	2	3	G94	G934
68	2	36	Y7B	Y79B
		37	Y7C	Y79C
		38	Y7C1	Y79C1
65	2	2	KK	KX
67	1	44	Y354E	Y354BE
70	1	14	71	72
			1P1	[1P1]
71	1	23	X9:89P25:7:1N	X9:89P25:7:1L
		24	X9:89P24:7:1N	X9:89P25:7:1N
57	2		Transfer the two lines after "9P68" to just above "9Q".	
64	1		Transfer "with HW" to the next line and omit "HWB" from the latter line	
	2		Transfer the 4 lines beginning with "K9W" to "K9X2" respectively to just below the linė beginning with "K9V97" in page 65 column 1.	

93 Additions to the Schedule

Add the following isolates at appropriate places in the pages mentioned:-

1 In page 60, add after Note 42

More Concrete Sector

9Z2	One-off
9Z3	To -order
9Z4	Batch
9Z5	Mass

2 In page 61, column 2, add

D93	Appreciation
D94	Depreciation
D95	Scratch value
D96	Market value
D97	Book value

3 In page 62, column 1, add at the bottom

DS	Dividend

4 In page 67, column 2, add

Y5923	Contract of appointment
Y547	Praise

5 In page 69, column 1, add

Y79Z	Staff participation in management

6 In page 70, column 2, add

2S	Line and staff
2T	Line
2U	Staff

A METHOD FOR RECORDING LOANS IN SPECIAL LIBRARIES

M. ARMSTRONG

Metal Box Company, Research Division, London

Describes in detail a method of construction of a new loan record apparatus. Shows how this apparatus eliminates the need for maintaining two separate records - one according to due dates and another according to a chosen heading - for recalling a book. Uses only one card for these two records by exploiting the possibility of filing a card in two directions simultaneously, that is from front to back and from left to right.

1 INTRODUCTION

In every special library the recording and recalling of loans is a major routine which consumes a great deal of staff time, and much thought has been given to seeking a method which cuts down labour whilst maintaining maximum efficiency.

For every item that we issue from the Research Division library we require to keep two records, one filed under a chosen heading to enable us to locate the item as quickly as possible, and one under the date to enable us to recall it when it becomes overdue. The apparatus described below which has been in use for the last twelve months enables these two records to be kept by one card only, through exploiting the possibility of filing a card in two directions simultaneously, that is from front to back and from left to right.

This idea has already been developed to a certain extent by some office equipment manufacturers who fit to the bottom of a filing drawer a bed of rods on which cards can be placed so that they overlap. To make our apparatus flexible enough for use as a loan recording system the bed of rods is made in the form of a continuous belt (see diag 1.A). The rods themselves are spaced half an inch apart, measuring from the centre of one rod to the centre of the next. The belt is moved by turning knobs at B which rotate the pivots C.

The second major feature consists of two horizontal belts D made of canvas or other flexible material on which date guides are marked at intervals of half-an-inch, and which is geared E to the rod belt so that when the pivots are rotated both belts-move at the same rate and in the same direction. In this way, since the rods are also half-an-inch apart, any one date guide will remain in line with one particular rod. This is very important.

The third major feature is the cards themselves. They are indented along the lower edge as indicated in diag. 1 so that they stand firmly on the rods, the rods fitting into the indentations. The position of each card is naturally dictated by the date guides, e.g. card numbered 1 is issued during the first week in December therefore it is placed so that its left-hand edge just overlaps the rod beneath the date guide Dec/1. Card numbered 3 is issued during the second week in December therefore it is placed similarly on the rod

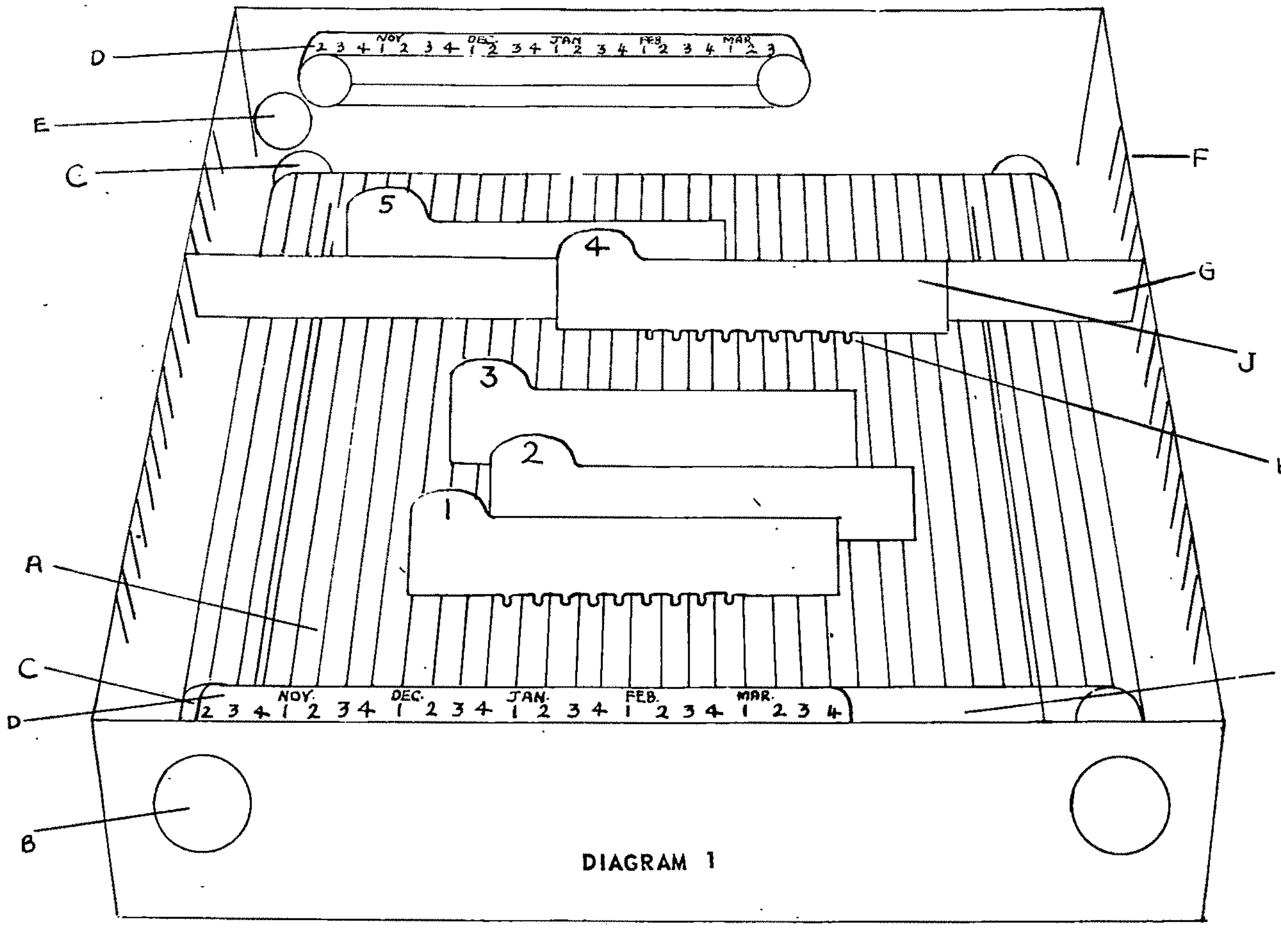


DIAGRAM 1

beneath the date guide Dec/2. Card numbered 2 is issued in the fourth week in December therefore it is placed, in order, that is between cards numbered 1 and 3 on the rod that falls beneath the date guide Dec/4 and so on. As the loans issued during the earlier months are returned the left-hand rods become vacant. Therefore the rod belt and date belt can be moved from right to left. This automatically shifts the remaining cards over to the left-hand side so that there is room for the current loans, and shifts the date guide so that it will show Jan-May instead of Nov-March and so on throughout the year. Briefly then it will be seen that the apparatus 1) is self perpetuating, needing the minimum of adjustment, and 2) enables cards to be filed simultaneously in date order and order of heading chosen (which may be numerical or alphabetical, or both, since it is possible to have two sequences, one behind the other).

2 DETAILS OF CONSTRUCTION

21 The Rods

As already stated the rods are in the form of a continuous belt rotated at pivots C by the knobs B and are half-an-inch apart measured from the centre of one to the centre of the next. An important point is the diameter of the rods. It follows that the narrower the rods the greater the space possible between them. A compromise must be made between having the rods thick enough to support a total weight of cards of five pounds or more and having the space between each rod wide enough so that the cards do not have to be cut away too much which would weaken them. Our rods are a quarter-of-an-inch in diameter. As they are half an inch apart (measuring always from the centre of one rod to the centre of the next) it follows that the space between the rods is also a quarter of an inch. By punching the lower edges of the cards to a depth of three-eighths of an inch, so that spaces five-sixteenths of an inch wide alternate with tabs three-sixteenths of an inch wide there is enough tolerance to ensure that the tabs fit easily between the rods but will not readily slip out (Diag 2). Other factors could influence the thickness of the rods. One is their length which will be discussed further on. The other is the material they are made of. Thus it might in certain circumstances be possible to have a thinner rod if desired. However our cards are punched according to the stated measurements and though of fairly light stock have been used many times without damage to the tabs.

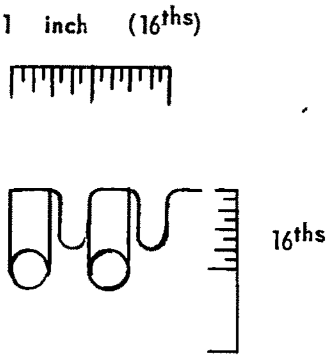
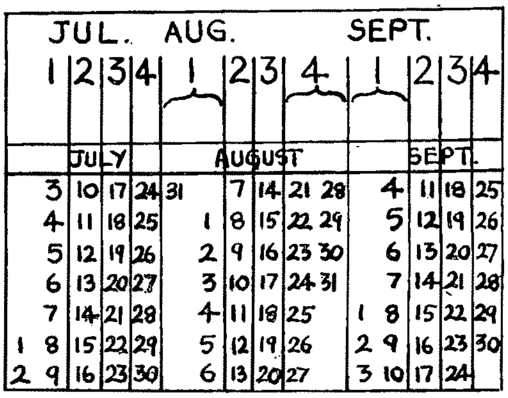


DIAGRAM 2

22 Date Belt

The date guides must be chosen so as to enable the date-belt to be self perpetuating. For our purpose it was decided to make each one represent one week. Therefore all the cards for items issued during one particular week are filed with their extreme left-hand edges overlapping the rod that lies beneath their particular date guide.

By adopting an arbitrary division of four weeks to the month and therefore ignoring the fact that some months cover nearly five weeks it is possible to have a regular sequence marked on the date belt which covers a whole year, i.e. forty-eight date guides. The date guides are marked 1, 2, 3, 4 (denoting first week of the month, second week, etc) i.e. Jan/1.2.3.4 Feb/1.2.3.4. etc until Dec/1.2.3.4. followed by Jan/1.2.3.4. again and so on. The date guides are not marked with actual dates since any sequence chosen (e.g. 1, 8, 15, 22, 29) would fall on different days from month to month including Saturday and Sunday, and would therefore lead to confusion. Over a period of a year, as will be seen, four weeks are lost, but in a flexible system, as it is possible for this to be, those four weeks can easily be incorporated into the other forty-eight e.g., if there happens to be five weeks in a certain month the fifth can be combined with the fourth (Diag 3). As the cards need never be located by date as they are also in numerical or alphabetical order the position chosen is not important from the point of view of filing.



JUL.				AUG.				SEPT.			
1	2	3	4	1	2	3	4	1	2	3	4
	JULY			AUGUST					SEPT.		
3	10	17	24	31	7	14	21 28	4	11	18	25
4	11	18	25	1	8	15	22 29	5	12	19	26
5	12	19	26	2	9	16	23 30	6	13	20	27
6	13	20	27	3	10	17	24 31	7	14	21	28
7	14	21	28	4	11	18	25	1 8	15	22	29
1 8	15	22	29	5	12	19	26	2 9	16	23	30
2 9	16	23	30	6	13	20	27	3 10	17	24	

DIAGRAM 3

Since this idea of filing by arbitrary periods instead of by concrete dates might seem somewhat inexact the following comments may not be out of place. To choose a definite period of loan from one date to another, especially a calendar division as a week, fortnight or month is popular because this period is constant and therefore easily remembered and accepted by everyone. Also, where the date and author records are kept in separate files it is necessary to have a definite date in order to trace the card in the date file when the item is returned. So far as our library is concerned we require that the material is returned after a reasonable period of time but we do not require, for instance, to enforce a rigid rule that material lent out this Monday must be returned next Monday. Also we do not need a definite date for tracing the record because the card need only be searched for under the heading. Therefore so far as we are concerned it is far more convenient to have a date belt that gives arbitrary divisions but is self-perpetuating throughout the year, rather than to have to adjust it to make it rigidly accurate. Items required back in a hurry for someone else are given special treatment. This loans system of course is only used for lending our own material to our own people. In deference to the custom of other libraries we keep records of loans either borrowed from or lent to them in strict date order in a separate file.

It would be possible for the date belt to be marked in alternative ways. For example a library issuing loans for a very limited period might find it more convenient to have the date belt marked with the days of the month instead of weeks in the year therefore the belt would be marked 1 - 31 and would be self-perpetuating in days only so that each sequence would have to have the name of the month indicated to avoid confusion.

23 Dividers

It is necessary to support the cards front and back and also helpful, though not absolutely necessary to separate the various sequences. This is easily achieved by cutting slots (F) down the sides of the frame at one-inch intervals and inserting strips of plywood (G) where required. It is advisable to cut the slots down to just above the level of the rod belt so that the dividers do not actually rest on the rods. The dividers must not be higher than the tops of the cards.

3 DIMENSIONS AND QUANTITIES

The interval of half an inch between one rod and the next and therefore between one date guide and the next was chosen as being wide enough to show sufficient difference between the cards under various dates and small enough to enable the apparatus to be of convenient size. Also, the importance of adequate spacing between the rods so as to ensure that the cards do not have to be punched away too much has already been explained. The closer the rods are together then, the less space possible between them. This can be offset to a certain point by having narrower rods, but then the question of strength would have to be considered. So by and large an interval of half an inch satisfies all requirements.

31 Cards

A further major consideration is the size of card. A very important feature of this apparatus is that every card must overlap every other card if only at the extreme edges. If this is not ensured the front to back sequence will be broken. In diag 1 the cards provide one clear sequence 1 2 3 4 5 since it can be seen that each card overlaps all other cards. But in diag 4 the cards are not all overlapping with the result that there appears to be two sequences i.e. 135 and 245 where there should only be one.

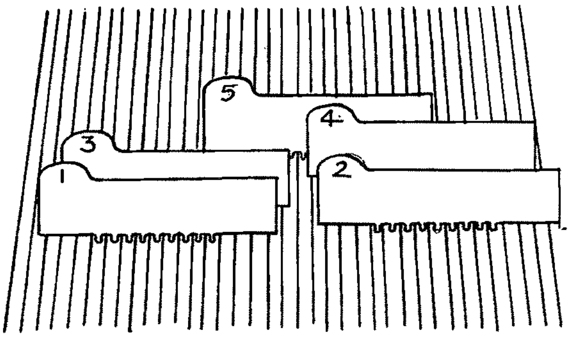


DIAGRAM 4

This would lead to confusion. Therefore, as the card on the extreme right must overlap with the card on the extreme left it follows that the maximum period of loan possible is represented by the length of one card. Our cards are eight inches long which is sixteen half-inches and therefore gives a period of four months. This is illustrated in diag 5.

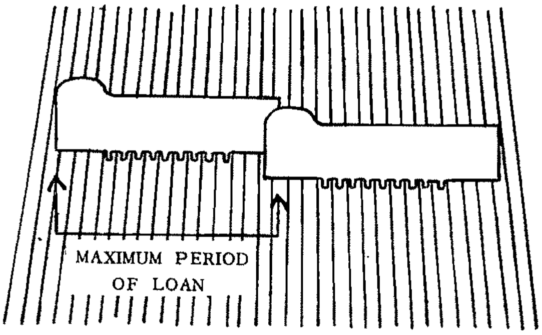


DIAGRAM 5

Naturally the material can be checked at any time within that period but it does provide a generous range if required, before the most overdue cards have to be moved and the belts turned. A shorter card would, of course, give a shorter loan period.

The main body of the card, that is the writing surface, is two and a half inches high which, using the back as well, gives ample space for the heading and some forty recordings. The bottom tabs are three eighths of an inch deep and the top tab is half an inch deep and one and a half inches long. Although the rods are half an inch apart on the flat surface of the belt the spaces between them widen as they approach the pivots and any cards with their tabs caught between these rods would be mutilated. For this reason almost two inches at both ends of the cards is completely punched away leaving the row of tabs in the centre only (diag 1. H). In this way no matter how near the card is to the pivot it cannot be damaged.

By putting the heading or the first (and therefore alphabetically most significant) word on the top tabs the broken nature of the file uncovers them here and there so that no guide cards are needed.

32 Date Belt

By choosing four date guides for every month it follows that forty-eight date guides, therefore forty-eight half-inches are needed. Therefore the date belt is twenty four inches long, but since it is continuous and some of it will be taken up at the sides by the pivots less than half, about eleven inches shows.

33 Card Belt

The breadth of the surface of the card belt must be the span of two cards minus half an inch overlap for, as has been seen, they represent the most overdue and the most up to date cards. With eight inch cards this represents fifteen and a half inches, and thirty-one rods. In this way it will be seen that the card belt will be longer than the date belt because, although the ends of the cards on the right hand side of the belt have no date significance they must be accommodated on the rods (Diag I. J). Therefore the amount of rods in the belt will be thirty one (on top) plus thirty-one (matching rods beneath) plus how ever many rods are taken up by the pivots.

The length of the rods (which represents the depth of the card belt) determines the amount of cards which can be accommodated and therefore the amount of loans. Our rods are fifteen inches long. Reckoning one hundred cards to the inch and allowing sufficient space for handling and supporting the cards, this allows just over a thousand loans, and keeps the apparatus a reasonable size. With the frame it is approximately seventeen inches square. Longer rods of course would accommodate more cards, but the longer the rods the more difficult it would be to file the end cards. Also the stronger the rods would have to be, so as not to sag through supporting a greater amount of cards; every two hundred medium weight cards weighs about one pound.

4 USE OF COLOUR

Our rods are in multiples of four and each four rods are painted in a regular sequence of four distinctive colours. The date guides (which are also in multiples of four) are painted to match. This means that the first period of the month is always black, the second red etc. This is of great assistance in filing. It is difficult to associate the correct rod with the date guide under which it falls when the line of vision is broken by cards. Since one colour is only repeated every four rods or two inches, possibility of error is negligible. Having a date belt back and front also assists the eye.

5 FRAME

The whole apparatus is enclosed in a wooden frame and should always, when not in actual use, be covered by a closely fitting lid to keep out as much dust as possible, for, since the cards are more exposed than normal filing cards they naturally tend to get dirtier. We use white cards but are experimenting with buff cards for this reason.

As an additional precaution against sagging, a wooden base is fixed across the apparatus through the rod (diag 1. H).

The author wishes to thank Mr. Henry C. Tester who built the apparatus for the library.

AMERICAN LIBRARIES

SOME IMPRESSIONS

S. DAS GUPTA

Delhi University Library, Delhi

Gives a short account of the impressions of the author on his visit to U.S.A. under the India Wheat Loan Educational Exchange Programme during February 9 to July 9, 1955. Brings out some current trends and novel features employed in University Libraries, Public Libraries, Special Libraries etc. Provides a limited background of information relevant to the development of libraries and library service in India.

0 GENERAL BACKGROUND

The American libraries can overawe an Indian visitor by their large size and by their wealth. But neither size nor wealth really changes the character of basic library problems. In fact size may accentuate some problems while wealth may tend to obscure and delay the emergence of ultimately satisfactory solutions, though it also makes many interesting experiments possible. In the assessment of the real achievement of American librarianship, size is a secondary factor and wealth is only marginal. The prime factors are still the integrity, intelligence, education, training and experience which the professional librarian brings to his problems and the appreciative support the library receives from its enlightened authority or community. In both of these fields the American achievements are most impressive. Indian librarians and Indian library authorities have much to profit from them.

1 UNIVERSITY LIBRARIES

11 Structure of the University Library

The structural pattern of the University library was developed in the 19th century. It reflected the prevalent pattern of research and programmes of study. Narrow specialization led to compartmental divisions of knowledge and the departmental fragmentation of the university library was carried to an excess. The undergraduate programmes of study were likewise affected by specialization. The prevalence of numerous course-units reflected the atomized approach to knowledge and, in the library, led to the development of 'reserve book' collections of 'required reading' materials consisting of a few titles. Apart from the study rooms for reserve books, the General Library of the University consists of Seminar Rooms, mainly for the Humanities, departments for reference books, periodicals, maps, documents, rare books, photographic materials etc. and the circulation department for the main collection of books in the university library.

12 Changing Patterns of Research

A reversal of the process of fragmentation of knowledge started in the fields of technology, because applied research required a co-operative approach between the sciences. The development of inter-disciplinary sciences, like biochemistry, and of the synthesised branches of knowledge, like geography, and the extended application of 'scientific method' to the study of psychology and the social sciences led to a wider integration of knowledge. In recent times the research areas of nuclear energy and its applications, and of the behaviourial sciences have become the meeting places of many an 'independent' discipline. The centres of area research, like the School of Japanese Studies of the University of Michigan, also represent similar developments. Integrated and cooperative research, involving several disciplines, is now a marked characteristic of academic life in the American Universities.

13 Changing Programmes of Study

At the level of course-studies extremely significant reintegration of the entire field of education is also taking place. The 'general education' movement, in its various forms, has changed universities like Chicago and Harvard. The 'liberal arts' have invaded even the Massachusetts Institute of Technology. Though the tenets of 'general education' are not accepted everywhere, the text-book-centred education is definitely on the decline. A greater stress is now laid on wider reading.

14 Effects on the University Library

For the university library, with its 19th century departmental framework, it has not been easy to keep up with these changes. From the beginning the departmental libraries, owing to their growing overlapping character, wanted severally many identical books. The library met this demand by duplication and multiplication of copies. But the materials, requiring to be duplicated now, have grown far more numerous and much more expensive. Only a few universities can afford to buy, without affecting their acquisition programmes, a dozen sets of the current edition of the Encyclopaedia Britanica or half a dozen sets of the Chemical abstracts or more than one file of the same set of serials. Nevertheless, some university libraries still find themselves without other practical alternatives.

15 Evolution of Divisional Organization

Some university libraries, however, have evolved a different type of organization which consolidates book-collections in allied or related fields, like the biological sciences, the social sciences, etc. Library service is developed from these new 'divisions'. In some universities, when the opportunity to have a new library building occurred, the divisional pattern was almost embodied in the building itself and the departmental library of the older variety was superseded.

16 New Variety of Departmental Library

There is also an interesting example of a new variety of departmental library where the librarian has the responsibility to organize service to eminent research scholars in the field of nuclear energy and its applications, utilizing the resources of the entire campus but without having many custodian responsibilities. This type of development is full of potentialities and perhaps it also holds the key to the future of the departmental library, particularly because its total abolition does not promise to be a satisfactory solution in every case.

17 Old Departmental Library and Research

The traditional departmental libraries have a major shortcoming. They are attached to the faculties; yet they are not everywhere able to provide research services. The librarians are generally overburdened with numerou administrative duties, devolving on them with the custodianship of steadily accumulating reading material. They are also charged with the responsibility of serving non-research students. In the larger departments they get fully engage in services connected with circulation, ready reference and book reserves. Library assistance to research scholars, based on modern documentation techniques, has so far developed tardily in the universities, largely because of the heterogenous character of the departmental library. The way documentation service is now being developed in some universities, like Stanford, also confirms the view that such technica services need for their unimpeded development a wider base than the traditional departmental library and may be organised with the essential tools but away from the general custodian responsibilities. The work being done in Stanford illustrates further how research assistance based on 'divisional' organization can be built on top of the traditional departmental pattern.

18 New Concepts of Undergraduate Service

The concepts of service to the undergraduate have also profoundly changed. Nowadays a much greater emphasis is laid on free and easy contact between students and the resources of the library. Some college libraries, like the Rockford College Library, have achieved an almost complete and ideal integration between the reader and the book in an attractive atmosphere of pleasant informality and homely comfort, with a trustful reliance on self-service. At several universities the collection of reserve books have been considerably enlarged and a major part of it is freely accessible to the students. Some universities have started separate undergraduate libraries with 75,000 to 100,00 volumes, while some are also having new buildings to house them.

181 Lamont Library

The Library which has given a pioneering lead in this field is the Lamont Library of Harvard. It may be described as an institution truly symbolizing the philosophy of 'general education'. Some of the universities with new library buildings and a high proportion of undergraduate enrolment have been greatly influenced by the Lamont Library. In fact this Library has a message for university libraries all the world over.

2 PUBLIC LIBRARIES

21 Uneven Development

The public library systems in America are in different stages of development. The most developed systems are to be found in the metropolitan areas, in the bigger cities and in some of the more populated or prosperous counties. Many of the smaller cities and a large number of counties do not have adequate number of libraries. Some rural areas do not have libraries at all. On the average, the local authorities spend on public libraries about 5%. of their total education budget.

22 Problems of Library Extension

The most pressing problem in the public library field is the problem of library extension. It is being dealt with in a variety of ways aiming at: (1) consolidation of local units into larger library areas; (2) centralisation of library administration and decentralisation of library service in the areas so formed; and (3) seeking financial support from the States Governments. The consolidation of local units into larger library areas under unified authorities is made difficult by the structure of American local government and of the tax-system. At the local level there are several governmental units, often with numerous types of overlapping jurisdictions, independent taxing powers, and separate shares in the tax-dollar. In most of the States the laws put a limit on the general property tax, which restricts the revenues for local services, including library service. Frequently, the laws also limit the millage, or the taxation rate, for library purposes. Some ingenious ways have no doubt been found to by-pass these limitations But the fiscal hindrances are real and deeply entrenched in American government and politics. In the circumstances library legislation has been piecemeal. In some States, however, the law has halted the trends towards fragmented development by fixing the County or the City of 5,000 population, as minimum units for library purposes.

23 State Library Agencies and Their Activities

The most significant and far-reaching development has been the emergence of governmental agencies at the State level to help the promotion of library extension. The activities of such agencies may include: (1) framing policies and planning programmes; (2) providing technical help, advice and training facilities; (3) fostering cooperation among neighbouring local units; (4) giving libraries financial help in cash or kind; (5) organizing demonstration and pilot projects; (6) undertaking wholesale publicity and public relations programmes; and (7) working for changes or improvements in the State library laws.

24 Organization of State Library Agencies

The study of the more developed county library systems and the big metropolitan systems is equally interesting. The manner in which the county and the metropolitan systems have decentralised service and reduced the load of administrative duties in the local service units, is quite remarkable. Modern communication and transport systems, modern inventions and machinery have all been utilized to make service diversified and speedy. The use of IBM Machines in the King County, Washington, for maintaining records for book-movements and for providing elaborate catalogues to branch libraries, has mechanised innumerable repetitive operations and enabled the branch librarian to devote himself better to the readers' services. In the Detroit metropolitan system the same type of machinery has been used to centralise the records of charging systems, in order to relieve the branch librarian of routine operations. These and similar changes, which do not necessarily depend upon machinery, have now made it possible for the librarian not only to develop service in a variety of ways but to integrate the library with its neighbourhood.

25 Developed Public Library Systems

The set-up and the functions of the State library agencies vary widely from State to State. Their powers and the funds at their disposal are strictly limited. They are able to function successfully because of their compact organisation. In Michigan, for example, the organisation consists of a small State Library Board with the State Librarian as its executive officer. The State Librarian is assisted by a team of about 7 or 8 librarians, each of whom is an expert in a different branch of public library service and each holding charge of a different area of the State. They function together in the State Library which has been formed into a base of extension operations. Every extension area in the State is linked with it. Besides being highly compact, the organization is economical, efficient, informed and versatile.

26 Modern Service Concepts

The service concepts of the public library are no longer confined to making books available in its premises. The development of the Reader's Advisory Service, the use of non-book materials like pictures, films and records, and the development of group activities, like talks, forums, lectures and discussions, have turned the library into an active community centre. The Public Librarian is a participant in many local activities and he works in close cooperation with active local groups, such as youth organizations, women's clubs, workers' education groups, and groups of businessmen and of social workers.

27 Structure of Public Libraries

The public libraries have developed their structure according to (1) grouping of readers by age, and (2) the special character of different materials. To the basic pattern of differentiated service to children and adults has now been added a special service to youth. The pattern based on character of materials has, however, become increasingly diversified. To the earlier materials of ordinary books, reference books and newspapers and periodicals have been added pamphlets, documents, rare books, manuscripts and archives, and several types of non-book materials, like maps, pictures, photographs, films, phonographic records, photo-and micro-facsimiles etc. Depending on the size of their collection, libraries have set up special service units for different materials. With the growth in the collection of the ordinary book materials, the larger public libraries have developed a departmental pattern of organization based on subjects, like Science, Technology, Fine Arts, History and Biography, etc. The subject departmental pattern has been replaced in some places by a 'divisional' pattern of organization which is similar to the divisional organization of university libraries. In the public library field also, the 'divisional' pattern is considered better integrated, more economical and more convenient to users.

3 LIBRARY ADMINISTRATION AND SERVICE

31 Administrative and Technical Set-Up

The services in the library are classified into two groups: (1) readers' services, which include circulation, reference and departmental work; and (2) technical services, which inclde acquisition, ordering, cataloguing and maintenance of books. In recent times the area of the 'technical' services has been brought together under one chief administrator. This succeeds the older pattern in which the functional units could have each its own chief, directly under the head of the library. Administratively the newer pattern is better integrated; it centralises control more gradually, links related or similar operations, claims to assure a better flow of work and may also result in economy.

32 Librarian and the World of Books

The two major divisions of readers' services and 'technical' services are riveted at the top. This achieves the purpose of administration but does not in itself produce the best integrated organization for the professional librarian. The bibliographical control of the library rests at the points of contact between the library operations and the world of knowledge. The points of contact, which are also the centres of bibliographic control, are located in the operations of book-selection, classification-cataloguing and reference and bibliographical assistance to readers. For a better integration of the professional librarian with the world of knowledge and of books, these centres of control need to be imaginatively set up and effectively interlinked, which administration alone does not achieve. In the public libraries in America the professional librarian is better integrated with the book-world. Even in the big metropolitan system of Detroit, in spite of centralised administration, the branch librarian is actively participating in selecting books, classifying books according to the 'readers' interest' scheme and giving reference and bibliographical assistance to readers. This triple link with the world of knowledge and of books is not always maintained in the university or college libraries and, consequently, 'bookmanship' as an art does not grow out of the day's work. On the whole the machinery for book selection in the university libraries is more of a channel for routing faculty recommendations than a creative centre of contact between the librarian and the book world. Whenever the librarian is an active participant in book-selection, the results are more satisfactory, as in some departmental libraries of Michigan and in the university library at Stanford.

33 Acquisition Policy and Programmes

Nevertheless, most libraries have well planned acquisition policies and programmes. For quality, quantity and variety the bookstocks in American libraries are superb. The mounting cost of books and increasing storage problem have led to the development of: (1) co-operative acquisition programmes, as between some libraries in Chicago, and (2) co-operative arrangements for acquisition and storage, as between the Mid-West university libraries, or, (3) simply economical storage in separate buildings. Co-operative acquisition programmes on a nation wide basis have led to developments like the 'Farmington Plan'. The regional bibliographic centres actively promote cooperative programmes among the libraries of the region. Many surveys of library resources of individual libraries, of libraries in a region, in special subjects, etc., are available. The union catalogues, maintained in the bibliographic centres and the Library of Congress, make practicable the cooperative use of materials, regionally or on a nation-wide basis.

34 Periodicals

The collection of periodicals and serials is equally impressive. Various mechanisms are used for checking and claiming periodicals. But no arrangement seems to be at once economical and fully efficient for claiming. Visible files are used extensively, but the USDA Library, which has about 20,000 items on its files, has changed over recently from the visible file system to a simpler card-and-tray system. Even here the procedure for periodic review of the overdues continues to be time-consuming. The system of 'check-cards', prevailing in India in some libraries, seems to be quite satisfactory though it remains to be tested whether it could carry heavy loads efficiently. At many places combined records are kept for serials and 'books in series'. But the combination is not of equals. A system of physical control works well for serials but for 'books in series' the control is bibliographical also. It should, therefore, form a part of or be linked with the control system of book selection.

35 Documents

Through enlightened government policy many libraries have become depository centres for State and Federal publications. In the past separate documents departments had been set up. But it is not clear if the handling of this type of material could not be equally advantageously done without the creation of a separate department. At least one important university library is moving away from the older practice. The bibliographical control of documents is, however, highly complex and requires special attention.

36 Microfacsimiles

Immense economy and numerous advantages have resulted from the different types of microfacsimile collections. Libraries have built up useful collections of newspapers without wasting costly space and facing expensive preservation problems. Even small college libraries now possess a complete file of the New York Times in microfilm and house it in one or two small cabinets. For current research material as much as for unobtainable retrospective materials, the effects of the various types of microfacsimile will be no less than revolutionary.

37 Classification and Cataloguing

The Library of Congress Scheme of Classification has been adopted by most of the bigger University libraries, as it is regarded as more efficient than the Decimal Classification Scheme for organising specialised collections of book materials. But the role of classification has tended to decline and no greater use of it is generally made than for purposes of locating books on shelves. Even its utility to secure helpful shelf-arrangement has diminished. The vastness of book-collections invariably creates distance between books in related subjects and the benefits of 'open access' to the shelves have become questionable when the dead or the dormant materials are not separated from the alive and the functioning. Only through the formation of separate sequences of functional and less functional books can browsing be vitalised again. The value of classification is further obscured by the almost universal use of the dictionary catalogue and dependence on standard lists of subject headings.

371 Classified Catalogue

The classified catalogue of the John Crerar Library, though it is not new, continues to be one of the major exceptions. At a time when the dictionary catalogue as a bibliographical tool is battling against the deadening weight of its own cross-reference structure, the efficiency of this classified catalogue of a very important library remains largely unknown. Admirable scholarly work has been done recently by Shera and Egan to indicate the basic principles and practices of the classified catalogue and to improve its role in the organisation of library materials. Since, however, the efficiency of the classified catalogue is dependant on the scheme of classification upon which it is based, the demonstration value of the John Crerar Library Catalogue, which uses the Decimal Classification, may still remain inconclusive.

372 Dictionary Catalogue

A good deal of thoughtful study of the Dictionary Catalogue has also been made in recent times. But solid practical results are yet to come. Many institutions, including the libraries of Harvard University and Massachusetts Institute of Technology, have been using a form of catalogue divided into two alphabetical sequences: (1) by author, title etc., and (2) by subjects. This has certain advantages, just as the current trends of shortened entries and simpler cataloguing have their own value. The importance of 'descriptive cataloguing' has, however, somewhat diminished. But the main threat to the usefulness of the Dictionary Catalogue which comes from within itself remains unmet.

373 Library of Congress Cards

A large number of libraries are making use of the Library of Congress printed catalogue cards. Some of the big University libraries are able to get the Library of Congress cards for as much as 40% of the books annually catalogued in their libraries. This no doubt represents a substantial saving of professional staff-time. Some of the gains accruing from the centralised cataloguing and classification system are, however, lost by the Library of Congress cards not being available or being delayed. Methods of card reproduction by multilithing, mimeographing, and xerography (or dry photography) have enabled some libraries to speed up cataloguing, either by eliminating dependence on the Library of Congress cards, or by making use of the Library of Congress proof card which is available earlier to reproduce their own cards.

374 .New Indexing Methods and Machine-Search

A rapid progress is noticeable in the development of specially designed types of analytical indexing methods, which are being increasingly used in the research libraries for controlling efficient storage and quick retrieval of information. Machine-search, by punched cards magnetic tapes etc., is being extended and made more efficient by the application of analytical techniques of indexing to coding and prefiling of information. Taube's 'uniterms' and 'dictionary of associations' and Perry's 'semantic factors' are significant ideas and in many ways similar to Ranganathan's ideas of 'facet analysis' and 'isolates'. The American developments, being limited only to depth-analysis on the 'language plane' and not related to the wider range of depth-classification on the 'idea plane', cannot have any direct effect on the organisation of materials on shelves or files, or of records in the traditional catalogues. The potentialities of machines now being used might even increase through the use of classification techniques being developed in India.

375 Readers' Interest Classification

In all the branches and in one department of the Detroit Public Library the organization of books on shelves is based on an engaging pattern of classification, derived from the basic interests of human life. Logically it involves cross-classification and, therefore, it is not Aristotelian. The ordinary schemes of bibliographical classification have one feature in common. They are analytical and they attempt to divide knowledge into mutually exclusive fragments. But a man's life is not fragmentary. For example, when people marry or set up a home or have children, the complex of their interests is as whole as life itself. To them the effect of any analytical schemes of classification, however broadbased, looks 'disorganized'. It is not less of classification that suits them better. They need a different kind of classification and more of it, with well-articulated, well-formed and well-organized details. The Detroit scheme of classification is a fine example of what the right kind of technique in its right place can achieve to liven up a mass of books in such a way that the arrangement itself communes with life. Such a classification helps the ordinary reader. It trains the librarian to see all-together the many lines of interest that pass through the nodal points of life, to assess from the use of books whether the library really has its roots in the community, and to develop concrete and humane notions of book selection and book service. Being, however, limited by its own relevant purpose, the readers' interest classification is not intended to be used to organize large collections of books for multipurpose use, for which analytical schemes of classification are better suited.

38 Circulation

The most impressive feature of the American library is the manner in which consciousness of service permeates the entire institution and controls all its activities. "Books are for use" is not a slogan but a whole-heartedly accepted social responsibility. Excepting in certain restricted categories of materials, the rules of the library permit the freest and the most generous use of books. Readers often significantly referred to as 'patrons' -- can borrow from the library as many books as they desire or can carry. The procedure for charging and discharging of books is generally convenient and expeditious but not always most efficient and inexpensive.

381 Charging Systems

As a rule the university and college libraries prefer to interpolate or combine the Time and the Book records and often maintain a separate Borrower's record. The public libraries, however, prefer to maintain only the Time and the Book records. The use of a system of serial 'transaction numbers' has made combination of the Time and the Book records easier, especially when machines are employed. The transaction number has also made it conveniently possible to centralise Issue records of all departments and branches of a large library system, as in Detroit, and has relieved the service points of all subsequent routine operations.

382 Charging Machines and Manual Methods

The quickest method of issuing books is achieved through photographic charging and many large institutions with heavy circulation work, especially among the public libraries, have introduced it. There are a number of other methods which use mechanical equipments simple or complex. Some libraries use machines like the I.B.M., some use Marginal Punched Cards and Needles, and some others simpler and less expensive equipments. But no system using machinery is wholly satisfactory from all points of view. Some of the methods depending on manual manipulations are, however, remarkably flexible and efficient, besides being simple and inexpensive. The 'tab charging-systems', using scotch tape or other tabs, have been able to operate conveniently with a single record, which gives information in one file both about the due date and the book.

391 Reference Service and Materials

All libraries, big and small, provide a reference service. In fact a library would be unworthy of its name without it. In the university libraries and in many big public libraries the Reference Department is generally most monumentally housed. The vast collection of reference materials strikes one as the most impressive display of the library's immense bibliographical resources. Equally fascinating is the manner in which reference service is rendered to the enquirers on a person-to-person basis by a courteous and qualified staff. The most frequently used materials in the reference department are, however, comparatively quite small and consists mainly of the current 'ready reference' tools and some information files which are maintained by the department.

3911 Meaning of 'Reference'

While reference service no doubt constitutes the keystone of library service, there is not, however, sufficient unanimity on its definition, scope and limits. The functions of a receptionist, a readers' advisor, or less frequently a research assistant, may sometimes be assembled with 'ready reference' service. It becomes difficult to disentangle the essential function from the contingent. The definition becomes more elusive when the organization of reference service is also affected by the organization-pattern of the library. As a result the function has also acquired a variety of locally restricted meanings. That reference is an all pervasive function of the library, involving its total bibliographical resources and relative to the totality of the information-needs of its clientele, is a concept which is accepted but not always translated into practice. 'Reference service' tends to become the finding of answers to 'reference questions' from 'ready reference' materials. If more than this is involved the service develops into research assistance, or, in the public library, readers' advisory service.

392 Readers' Advisory Service

The vitality of the American public library is best evidenced in the readers' advisory service which is organised to help an individual to plan his reading. The planning of the service is very carefully done. It begins with an interview with the reader. Its tools consist of course-units of study and graded reading materials. The advisor helps the reader according to his needs and his ability to help himself. It is understandable that the librarians rendering this service have found it most rewarding. Often they find themselves in a position analogous to that of a teacher. In some cases, as in Cincinnati, the Readers' Advisor has begun to impart individual instruction. While the need for a service of that type may be compelling, the way it can be differently rendered is shown in Louisville, where the University and the Public Library cooperate, is not too dissimilar a situation, to provide for organized studies with the help of instruction. The two worlds of formal education and informal self-education are big enough in themselves. The fuller and surer development is likely to be symbiotic rather than hybird.

393 Group Activities: Discussion & Group Leaders' Training

Group activities form a large part of public library service. The library's success in this field depends on the leadership of the librarian, imaginative choice of programmes, aids and materials, planning of every detail with care, and proper execution. The audio-visual aids are most varied and plentiful, but their role is definitely secondary. The central feature of most group activities is the 'discussion', the conduct of which depends on the quality of the group leader. The training of group leaders, locally in the library, is an essential part of the librarian's activities. Some interesting training techniques have been evolved, for example the 'question-answer method' used in the leaders' training for the Great Books Programme. The way successful group activities have been organised in some of the county library systems is a tribute to the ingenuity of the librarian and his training technique of group leaders. Some well-conducted local programmes have been successful enough to earn nation-wide recognition.

4 LIBRARY ECONOMY: METHODS AND STANDARDS

Job analysis, classification of positions, cost accounting, time and motion study and similar techniques, have been used in libraries. Details of routine operations are carefully prescribed in the administrative manuals. Designs and forms of records are intelligently related to operations. Professional and clerical positions are clearly demarcated at many places. Principles of personnel administration are well developed. Over-elaboration of details and excessive specialization, incidental to large scale operations, sometimes restrict the field of the individual in administration. But the role of personality has its full play in the imaginative use of knowledge and skill, in enterprise and inventiveness and within the creative regions of administration and service. Bureaucracy is pleasantly absent. Discussions, meetings and conferences, formal and informal, at all levels, keep the system of communication clear of 'red tape' and transmission of information and intelligence is smooth and rapid. Large institutions are imbued with the spirit and consciousness of service and are operated and controlled with amazing ease and flexibility. Quantitative and qualitative standards applicable to operations and services in libraries, have been evolved on the basis of a variety of measurements and comparative statistics. Assessments of administration are based on objective standards, not on claims or opinions. American standards are, however, relative to American conditions. Costs are higher, mainly because salaries are high, 6 to 8 times greater than in India, and the quality of service is superior. The efficiency of the individual can also be very high, sometimes owing to simple skills. For example, a book-mobile service over an entire county may be run by a single person, who is both its professional librarian and driver and also in charge, at the county headquarters, of all technical and clerical work connected with the mobile service. Standards may vary but the methodology of standards and scientific management are considered of basic importance in the organization and administration of library service.

5 LIBRARY BUILDINGS

America in the post war period has witnessed a tremendous growth in library building activities. There are new buildings for all types and sizes of libraries. Much new thinking has come into their planning and construction. Already a considerable body of experience, gained by functioning in these buildings, is also available which in its turn will influence future developments.

51 Functional Planning

The ideas which dominate planning relate to changing patterns of education and research, to more vitalised service concepts, and to problems of library growth. Everywhere there is a pronounced shift towards providing a closer physical proximity between the books, the readers and the library staff. In the new buildings great new opportunities have unfolded themselves (1) for better integration of the book collections in related fields, (2) for bringing within easy access of the readers an almost unlimited choice of reading materials, (3) for provision of attractively laid-out and comfortable reading areas in different parts of the library, adjoining to the different shelving areas, and (4) for functional utilisation of space for all types of materials and services with the maxium provision for flexibility, expansion and interchangeability. The building itself is dynamic. The old rigidity of fixed stacks and of monumental reading halls has been overcome.

52 Modular Construction

The most revolutionary development has been the introduction into the field of library architecture of the concept of 'modular construction'. The entire library is conceived of as made up of a number of uniform modules. Each 'module', in two dimensional terms, is a rectangular area. One of its sides is a multiple of 3', which is the standard length of a book-shelf, and the other side is a multiple of $4\frac{1}{2}$', which is the centre-to-centre standard distance between ranges of shelves. At the corners of the modules are four columns which carry the weight of the roof or the floor above and eliminate the need for load-bearing walls. The height of the modules from floor to ceiling is 8' to 10'. Different sizes of modules, 18' x 18', 18' x $22\frac{1}{2}$' 27' x 27' etc., are being used. The particular choice of the length of each side is governed by the fact that it is convenient, though not necessary, that the area of the site be a multiple of the area of the module. Permanent or immovable elements, like staircases, elevators, toilets etc., are gathered together into a central core, so that the advantages of unobstructed open space, gained through modular construction, are not frittered away. Artificial lighting and air-conditioning have also made it possible to build on the entire area of the site and to dispense with light-wells, high roofs and narrow width. The compactness of the building has appreciably shortened the lines of communication, both vertically and horizontally, though horizontal communication still retains some of its snags. Most impressive are the effective and imaginative uses which have been made of colour schemes, draperies, distinctive equipments and furniture, and lighting and acoustics. The cost of modular construction is also comparatively lower. While in some educational buildings the cost of construction may be about $ 30.00 per square foot, in a modular library building it has been even as low as $ 12.00 per square foot. In small library buildings modular construction is unnecessary because columns are dispensable.

53 New Problems in New Buildings

The new building has brought in its trail new problems and not all libraries have tackled them in the same way or equally satisfactory. One major problem is to form easily understandable book-sequences on the shelves. In places open spaces have been divided into small alcoves, which have the effect of breaking up the book-sequence into many bits and which unnecessarily create circulation of traffic round limited reading spaces. Some times the books in the same field, which are shelved for one reason or another in a different shelf-sequence, have been separated unhelpfully by distance, even when the two sequences are running very near to each other. Similarly, the movement of books on the shelves, owing to addition of new stock, tends to upset sequence arrangements. A constant control is necessary on the collection in each sequence by weeding books from the primary sequences to a storage sequence. In some libraries this method has not received sufficient attention. The quantity of books on display sometimes oversteps the limits of usefulness and display has lost some of its distinctiveness. The principle of flexibility may have been also carried to an extreme. Some buildings which have constructed two floors of fixed stack in between service floors, as in the Cincinnati Public Library, have not suffered by rigidity. The almost total dependence on artificial lighting becomes expensive, though this is a problem which may be solved by new developments in technology. The potentialities of service in the new building are still in the process of realization.

6 LIBRARY SCHOOLS

61 Library Education in the University

The full professional course at the American universities is at the graduate level and leads to a Master's degree. There are also courses at the undergraduate level, mainly for school librarians and teacher-librarians. The graduate course in Chicago is organically an offshoot of the university's 'general education' system. This allows for a better directed preparatory education leading into the professional course and gives adequate time for specialization at the higher levels. Broadly, the library schools vary among themselves according to the degree of emphasis given on the theoretical content or the practical aspects of librarianship. Whatever the difference in emphasis, the objectives of library service dominate the outlook of each school.

62 Development of Library Education

The number of courses offered by the schools is large and varied, while opportunities to specialise in any field are plentiful. Since the days of Melvil Dewey, the curriculum in Library Science has steadily developed from training in a limited number of simple skills to specialising in a number of professional fields. The number of specialities, however, tended to become too many and began to divide librarians artificially. In recent times a considerable overhauling, reorganization and integration have taken place. The situation is still somewhat fluid. The re-accreditation of the schools into different types has not yet been completed. But the trends of development are fairly clear. Library education today is much less a training in simple skills. It is now an interpretative and unifying instrument for integrated use of library materials, tools and techniques in order to attain the objectives of service. Library Science has become a sociological discipline. Because the library is an institution in the field of mass communication of ideas and information, such a development is quite natural.

63 Current Trends

Yet the process of integration remains partial and incomplete. The idea of the 'use' of materials being more dominant, the idea of the 'organisation' of materials often receives less attention. The problems of re-designing the traditional tools and techniques have not been rigorously pursued. Some new and significant developments are, however, taking place. The teaching of 'subject bibliographies' is being related to the respective fields of research. That a research problem is itself many-faceted and involves a simultaneous approach from several sides is being recognised in the teaching of bibliography and training of the librarian. Similarly, the methods of "content analysis", being developed now, represent in themselves a multidimensional approach towards evaluation of literature and reading materials in relation to their use. Out of these studies clearer indications towards a revaluation of the organisation of the older tools and techniques may also become available. The Graduate Library School of Chicago, where these new developments are most in evidence, continues to hold its prominent place in the field of library education.

64 In-Service Training and Other Educational Facilities

In addition to extensive educational facilities in the universities, there are also facilities for in-service training in many major institutions, especially among the public libraries. The period of probation is often organised and utilised for training new personnel, according to the requirements of the particular library. In some places probation may be as long as two years and may involve a thorough on-the-job training. Some libraries also send information to the library schools on the performance of their students, so that such an exchange of information may be used to effect further improvement in the nature and quality of library education. The library schools, the library associations, the State library authorities and other agencies, continuously provide additional educational facilities at various levels, for special purposes and needs, through refresher courses, seminars, institutes, workshops, etc. The senior members of the profession or specialists in different library areas have their own meetings and conferences to study current developments and problems. All this helps to improve and widen the horizon of the librarian's intellectual outlook. The vigour and versatility of the library profession in America is as much due to the system and facilities of library education as to any other contributory factor.

7 SOME SUGGESTIONS

In relation to the development of libraries and library service in India, American experience becomes pertinent and gains in significance when Indian requirements are clearly formulated.

71 University Libraries

It is expected that the university libraries of India, which have already reached a certain stage of development, will be more rapidly expanded hereafter. Now is the appropriate time to examine in what directions the developments of the past have proceeded and to frame a policy of development for the future.

711 Study of the Structure of University Libraries Needed for Planned Development

American Universities clearly show that the older structure of departmental libraries, with a weakened General Library, is a costlier set up and unsuited to the development of research services. The emergence of integrated research and the emphasis on 'general education' also require a different library structure. The 'divisional' pattern of organisation, which has been recently developed, is better suited to modern requirements. It provides a wider base for the development of research services, efficiently and economically. The departmental libraries with custodian responsibilities, have led to a tremendous amount of duplication of material and are now also hindering the integrated growth of research facilities. The trends in India resembles the older trends in America. It is a matter of sufficient importance to examine if the structure of university libraries in India is flexible enough and suited to co-ordinated and integrated developments, both in the field of research and curricular studies.

712 Cooperative Programmes of Acquisition: Union Catalogue

In order to build up book-stocks systematically, the university libraries need to formulate their acquisition programmes sufficiently carefully, in relation to available materials and needs of research and study. Since it is not economical for every library to obtain every type of material, the neighbouring universities should be able to evolve cooperative acquisition programmes and specialise in different areas. The economies involved would depend partially on the extent duplication of advanced research is avoided by the universities. To make cooperation effective, the instrument of the 'union catalogue' of books, of the participating libraries, will be needed. In course of time the union catalogue can become the nucleus of regional bibliographical centres.

713 Improvement of Periodicals Collections

To improve research facilities, the periodicals collections of university libraries require to be increased manifold. Here too there is room for cooperative programmes, particularly in the holdings of back-volumes.

714 Development of Depository Centres in University Libraries for Government Documents

The collection of government documents is generally poor in the university libraries, which is a growing handicap. Early steps are necessary to establish in these libraries a comprehensive depository collection of Union and State Government documents. The costs to the governments will be negligible. But the benefits to students and scholars all over the country will be immeasurable.

715 Development of Micro-facsimile Collection of Books and Newspapers

The collections of microfilms and microprint materials have become urgently necessary to cover large gaps in the book collections, where retrospective material is unobtainable or costly. The libraries are also unable to maintain and preserve files of newspapers, which are increasingly becoming source-materials for a large number of research projects. It is far more economical to keep these irreplaceable records in micro-facsimiles.

716 Development of Photographic Reproduction Facilities

Facilities for photographic and micro-photographic reproduction should be available in the university libraries, as they are of daily importance in the development of service to research scholars. Large scale reproduction of materials would require larger plants and facilities for photographic reproduction of newspapers, books, etc., should be organised centrally for the universities and other academic and research institutions in the country.

717 Development of Services and Techniques

In the matter of library services the inadequacies of Indian libraries are due mainly to the lack of necessary provision for qualified staff. (1) Reference service is poorly developed and research assistance is almost wholly absent. These services, by which libraries are valued elsewhere, need to be developed with proper budgetary provisions and suitable training facilities. Research assistance, including bibliographical and documentation services, is most economically organised on a divisional' basis, covering the whole area of knowledge through a limited number of divisions, ike (i) physical sciences, (ii) biological sciences, (iii) humanities and (iv) social sciences. 2) 'Open access' and a physical set up suitable to integration of readers and books, are most mportant for developing the use of books. These facilities should be created in the university ibraries, wherever they are not available. (3) The techniques developed in India in the field of cataloguing, classification and documentation equire a more careful study, as they have many superior qualities. (4) The issue methods and irculation records, generally prevalent in India, are archaic. The 'accession register', which is maintained with considerable ritual in Indian libraries, is elsewhere as dead as the dodo.

72 Library Standards

Library administration elsewhere has become fairly standardised. Cost calculations with regard to materials and operations are easily obtained. So far no organised attempt, excepting one by Dr. Ranganathan, has been made in India to formulate these standards. Recently, universities have received substantial non-recurring grants but without any provision for the services or the materials required in selecting, ordering, classifying, cataloguing, etc. Whatever organisation tenuously exists in the university libraries, collapses under the weight of these benefactions. A formulation of library standards, suited to Indian conditions and requirements of technical services in the universities, is urgently needed.

73 Functional Buildings

In the field of library buildings India has much to learn from America. For larger buildings, modular construction is economical and allows for maximum flexibility and growth. But the height of the modules and the width of the building have to be adjusted to our climatic conditions and technology. Instead of the prevalent height of 8' to 10' in America, the height of the module in India should be at least 16' in the service areas, in order to avoid dependence on artificial lighting. Such variations of modular construction have been made with ease, as in the Lamont Library. Wherever possible the university library buildings should be air-conditioned, as it is a worthwhile investment with quick returns. Even in the field of small library buildings, the latest developments in America are not only simple and severely economical but functionally most efficient. What, however, needs to be avoided is some of the older type of American library architecture, which seems to have recently made its way into this country.

74 Improvement of Library Education Facilities

Library education is America's strongest point. Indian facilities and training methods resemble, by and large, what used to prevail in America in the 1880's. The social and the intellectual content of the curriculum is extremely limited. Dr. S. R. Ranganathan had turned library education into an intellectual discipline and lifted it above the level of simple skills, just as he has made other fundamental contributions in many significant fields of librarianship. The standard set by him in library education is not maintainable unless minimum provisions are made to develop the library schools of the country. The lines of development are clear enough. (1) The schools require the services of adequately qualified full time teachers. (2) As the schools do not attract good students, because the profession does not offer attractive prospects, it is necessary, as a first step towards securing better recruitment into the profession to institute All-India Scholarships at some of the selected library schools. (3) The curriculum of the library schools requires to be recast and its social and intellectual content to be improved. (4) As in some universities of America, the training in the elementary skills should be given in a three month 'vestibule course', leading into the basic professional course at the post graduate level of one academic year. Without this change, the standard of the one year course will not improve. (5) There are many reasons to consider changing the Diploma of the universities into a Bachelor's Degree.

75 Public Library Development

751 Instrument for Library Extension

The State agency for library extension in America is a remarkable instrument, compact, efficient, economical and easily adaptable to Indian conditions. The work of public library extension can become a wasteful enterprise for want of a suitable organization and base of operations at the State level, from where the extension schemes at the district levels can be helped, with technical knowledge of organization and service, and developed according to approved standards. The organization, functions and activities of the State Library agencies in America can be studied for many practical and fruitful ideas.

752 Public Library Service Techniques

The development of service in the public library is dependent on a few important techniques. The American techniques are of wider significance. (a) Reference service and Readers' Advisory service are basic to the development of book-service. They help to integrate the library with its neighbourhood in accordance with the needs and interests of the community. (b) In the area of group activities the development of discussion techniques and training techniques of group leaders from among librarians are the most essential elements for the development of social education programmes of public libraries. With these techniques alone the use of audio-visual or even book materials can become effective. (c) A more imaginative use of book arrangements on shelves, on the lines of the Readers' Interest classification scheme, is a simple technique of improving service in a big way.

8

CALCUTTA UNIVERSITY CENTRAL LIBRARY

DEFTH CLASSIFICATION *

20 SOME PROBLEMS OF A MANAGEMENT CLASSIFICATION

D. W. LANGRIDGE

British Institute of Management, London

Reviews the article by Dr. S.R. Ranganathan on Classification of management published in An lib sc 3, 1956, 33. Isolates some problems that need looking into in classification of management.

I do not propose to give a detailed criticism of Dr. Ranganathan's schedules which were printed in the June issue of the Annals as this can only be done after a period of trial on actual documents. Matters of terminology and missing isolates can be comparatively easily settled from experience of the subject and use of the schedules. I shall therefore concentrate on a few fundamental problems concerning the structure of a management class and its place in a general classification scheme. In the following discussion I shall use the word enterprise to denote any type of undertaking, and not merely economic ones.

In section 27 of this introduction Ranganathan refers to two interlocking puzzles in the classification of management: interlocking between technical and managerial skill and interlocking between the branches of management itself. I should first like to elaborate on Ranganathan's discussion of this problem.

The confusion is well illustrated by Class 65 of the UDC. To begin with the Class is called "Commercial Sciences, Organisation (here used as synonym for Management) and Traffic". Its first array of subdivisions are 651 Office management, 652 Commercial script 653 Shorthand etc., 654 Organisation of Telecommunications, 655 Printing, Publishing, Book Trade, 656 Transport organization, 657 Accountancy, 658 Business management, 659 Advertising. This is quite clearly a mixed array. Let us see if we can sort it out.

The analysis of the activities of any enterprise made by Fayol (referred to in Ranganathan's paper) is as follows: Technical, Financial, Commerical, Security, Accounting and Managerial. Of these, the technical activities are usually peculiar to the individual enterprise while the other five groups are common to many or all enterprises. So we now have 3 main elements which are illustrated in the chart.

From this analysis we can now place the first array of UDC 65 as follows:

651	Office = Activity common to many enterprises.
652/3	Commercial script, shorthand, etc = the technique of some common activities.
654	Organization of Telecommunications = A particular kind of enterprise.
655	Printing, Publishing etc = A particular kind of enterprise.

---

* Continued from *An lib sc* 3, 1956, 85.

656 Transport = A particular kind of enterprise.

657 Accountancy = Activity common to many enterprises.

658 Business Management = A large group of particular enterprises (roughly the group we sould call economic enterprises) + a number of activities common to many enterprises.

659 Advertising = Common activity.

The final complication is that some of the activities of class 3 may become the specialised work of an enterprise, in which case they need to be transferred to class 1. For example, advertising may be carried out by the firm which is producing and selling the goods or it may be done for the firm by an advertising agency; selling may be done by the Manufacturer or it may be done by a Retailer or Wholesaler.

CHART

1 Types of enterprise	2 Activities peculiar to a given enterprise	3 Activities common to all or many enterprises
e.g.	e.g.	e.g.
Schools	Teaching techniques	Office Work
Hospitals	Treatment of the sick	Finance
Farms	Ploughing etc.	Accounting
Manufacturing industries	Technologies	Selling
Catering Trade	Cooking etc.	Advertising
		Personnel work
		Management

If we take advertising as an example we can see 3 main types of book that are possible (1) Dealing with the techniques of advertising (2) dealing with the management of advertising (3) dealing with the management of an advertising agency. These are clearly different and should be distinguishable by a classification scheme. Ranganathan's schedule is quite free of any confusion between types of enterprise and activities carried on in enterprises so that (3) could be distinguished easily. I do not think however, that he has explained the other distinction in the best way by saying that "any branch of management itself throws forth all the branches peculiar to the main trunk management itself". The truth of the matter is that the "main trunk" commonly called management, and so called by Ranganathan, is miscalled. Reference to column 3 of the above diagram will show that what is usually called management is the set of activities common to many enterprises of which management is only one. It is therefore wrong to call selling, finance etc. branches of management. They are, in fact, co-ordinate activities. All this may appear pedantic in view of the commonly accepted use of the word but I think it is vital that we keep this difference in mind at the stage of analysis if we are to avoid confusion later.

If, then, we have a co-ordinate set of activities they should form one array of one fundamental category. In fact, in Ranganathan's schedule Management itself is in the first array of one category with the other activities in a subordinate array while the subdivisions of management (e.g. policy, organisation, planning and control) are in a different fundamental category. To continue using our example of advertising we get the following result:-

(X) = Management
(X)B3 = Advertising
(X)B3:1 = Advertising policy
(X)B3:2 = Advertising organisation.

Advertising management is not represented. Since policy, organisation etc. are parts of management it should immediately precede them. Ranganathan says that each branch of management throws forth its own branches similar to those of the main trunk. He proposes to show such relationships by introducing the subsidiary part of a compound subject by :8, e.g. Production management in the office would be (X)M:89A. But this would not be satisfactory for two reasons: (1) Management (:8) would follow its main subdivisions such as :1 policy, :2 organisation; (2) :8 would be a homonym for "Management" and "Control". The usual method for showing the relationship between isolates in the same facet is auto-bias. In Ranganathan's schedule we should still be unable to show e.g. Advertising management in this way because Management is the class itself and not an isolate in the same facet.

If we now examine Ranganathan's schedules we find that the main sections are not consistent: some are called "Management" while in others, like "Advertising", the title merely implies the activities. In the former case it means that while the management of the function itself is a synthetic number the subdivisions of management are analytical; in the latter case as we have seen with advertising, it means that while subdivisions of management of the function are represented, management itself is not. A further inconsistency is shown in the treatment of one of the subdivisions of management i.e. control. While it is represented analytically by :8 there are synthetic numbers for Production control, Quality control, Materials control. The same would be true for planning since it should be represented in Ranganathan's energy facet. Of course the difficulty is that although the idea of control is basically the same in each case it gives rise to different subdivisions in each case and makes notation difficult. But this should not be used as reason for the inconsistent treatment, as any new special application of control may arise which is not already provided for synthetically and call for its special subdivisions (e.g. Office control). Is it not a violation of the principles of Colon that the same basic idea should be represented in different instances by different fundamental categories? And even if we try to rectify the problem of the missing "management" by altering the name of the whole class and supplying the isolate "management" at the head of the energy facet, does not the same objection hold: that the management activities are in a different fundamental category from the other common activities of an enterprise?

We must also remember that, although the combination of a management activity with one of the other activities of type 3 in my chart will give the commonest form of compound subject, there will also be quite a lot of combination among the other activities. The reason for this is that these activities fall into two main groups (1) Main activities which are the object of the enterprise e.g. Production, Selling (2) Service activities which are not an end in themselves but an aid to the Main activities, e.g. Accountancy, Office work. The problem here is, is it going to be satisfactory to represent these compound ideas by auto-bias in view of the alternative orders it makes possible?

I have tried to show that what Ranganathan calls the interlocking of the branches of management within themselves is really two things: (1) the management of particular activities in the enterprise (2) the interrelation between certain activities common to many enterprises. (1) is really similar to the other interlocking puzzle of managerial and technical abilities. If you refer again to my chart you will see that Office management, Financial management etc. are all made up by a combination of activities from column 3, Production management is not. While the terms for Office, Finance etc. remain constant Production changes according to the enterprise - in school it is education, in hospitals healing the sick, in catering cooking and serving meals etc., and even according to the department of the enterprise, e.g. in the office production is office work. It is thus in production management that we find the greatest difficulty in distinguishing between the technical matters and the managerial.

Place of Management in a General Classification

Ranganathan has explained in his introduction the difference between pure and applied management literature. In deciding how to treat the subject in a classification scheme one may be tempted to take the analogy of History, where we have one main class plus common subdivisions for the history of particular subjects. The analogy would be misleading however, for the main class History is not "pure" history but the history of a particular group of activities which through long academic standing has come to be known as just "History".

We must consider the problem of management in its own right. Is it more useful to concentrate all the literature in one class or should it be distributed to the appropriate host class? To answer this question we must consider the users. They will fall into two main types: the management specialist and the person interested in a particular type of enterprise or sphere of activity. How does each arrangement suit these two categories? The answer to this, in turn, will depend upon the extent of similarity of management problems in different fields. If they are similar in all fields then the management specialist will be troubled by the distribution among host classes by going to too many places for all his material, while the enterprise specialist will be unnecessarily limited by the amount of material in his own management section. If, on the other hand, the problems are very different in particular fields then the enterprise specialist will be well served by the division into host classes while the management specialist will be inconvenienced only when gathering comparative material. In fact, neither of these positions is true. Some management problems are more common than others and enterprises vary in their amount of similarity to each other. To translate this into actual cases we could make a compromise like this. In the main class management we should put all material dealing with the problems and principles in general as they could be applied in any sphere, and the literature relating to diverse host classes such as Industry, Public Administration, Libraries, Schools, Hospitals would be distributed. The difficulty arises at the stage of subdividing Industry. It may be satisfactory to separate out agriculture and coal-mining, for example, but it would be both difficult and inconvenient to subdivide the literature relating to Manufacturing industries, (a) because of the difficulty of classifying the industries themselves and (b) because there are so many of them and most of the management problems are so similar that it would be almost impossible for the management specialist (such as an information officer in a management association or an industrial consultant) to use literature arranged in this way. Nevertheless, as a way of arranging the material within any subdivision of management it would be useful.

We have now, of course, a violation of one of the fundamental principles of the Colon classification (i.e. order of categories) but the case appears too strong to ignore. It is always possible, of course, to ignore the personality number in certain cases when filing but is not this merely dodging a real problem?

The difficulty of all this is increased by the fact that a large proportion of the periodical articles on management are drawn from the actual experiences of particular enterprises and therefore talk of a particular problem in a particular industry and often also in a particular country and/or a particular firm. But the problem may be common to all industries, or it may be common to the particular industry in whatever country, or it may be common to all firms within a given industry. In fact it is usually more common in one way or another than a specification of the article suggests. One has the alternative of classifying the article strictly, in the normal way, or using one's judgement as to which of the modifications are relevant. The first method gives universal uniformity in classification but does not give the best arrangement for the user: the second method tries to give the best arrangement but depends on the judgement and experience of the classifier and hence prevents uniformity. It seems we can't have both.

DEPTH CLASSIFICATION

21 PHASE AND INTRA-FACET RELATIONS

S. R. RANGANATHAN

Traces the evolution of the concept of phase relation. Distinguishes it from facet relation. Describes the five kinds of phase relation isolated till now. Shows the notational implementation of them in CC. Suggests a method for their implementation in UDC. Distinguishes intra-facet relation from laminated isolate. Describes the notational implementation of the former proposed in the forth-coming edition 5 of Colon classification.

1 TERMINOLOGY

For brevity in exposition and for the facility of the reader, a brief terminology is first given with some explanation and a few examples:-

Main Class is any class listed in the schedule of main classes of a scheme of classification.

Canonical Class is any conventional subdivision of a main class, not based on a train of characteristics, but listed as such in a scheme of classification.

Basic Class is a main class or a canonical class.

Examples: Mathematics, Physics, Biology are basic classes in CC and UDC. In the former they are main classes; in the latter they are canonical classes. Literature, Linguistics, History are main classes in both.

Train of Characteristics is a sequence of characteristics used successively in dividing a basic class, such that the wholes of the original universe are preserved as wholes in the subdivisions and their organs are not reached, and such that the subdivisions continue to be manifestations of one and the same fundamental category, be it personality, matter, energy, space, or time. For example, in Agriculture, the primary utility, the part put to the primary use, the species, the variety, the strain etc form a Train of Characteristics giving divisions which are manifestations of personality. The problem studied initiates another train of characteristics giving divisions which are manifestations of energy.

Facet of a Basic Class is the totality of the divisions of its divisions based on a single train of characteristics. For example, the schedule of plants given in the chapter on Agriculture is a facet of that basic class; so also, the schedule of problems given in the same chapter is another facet of it.

Facet of a Class is that division of it which is based on a single train of characteristics. For example, the class "Diseases of Rice Plant" has "Rice Plant" as its personality facet and "Diseases" as its energy facet.

Facet of a Class Number is that part of it which corresponds to a single train of characteristics. For example, J381:4 has 381 as its personality facet and 4 as its energy facet; J is the basic class number.

Isolate is a division in a facet forming a part of a class. For example, Rice Plant is the personality isolate and Diseases is the energy isolate in the example given above.

Isolate Number is the number denoting an isolate. For example, 381 is the personality isolate number and 4 is the energy isolate number in the class number J381:4.

A punctuation mark or any other preferred symbol such as the colon in the above example, is usedto link up the isolate numbers in a class number, is a Connecting Symbol. A connecting symbol does not denote any isolate. It is not a Substantive Symbol, used to denote a basic class or an isolate.

An isolate cannot be a subject by itself, but a basic class or a basic class and isolate(s) taken together is a subject. For example, Agriculture is a subject; Agriculture of potato is a subject; Agricultural Disease is a subject. But Potato by itself is not a subject; it must be attached to a basic class such as Agriculture, or Botany, or Domestic Science to yield a subject.

Facet Relation is the relation between the facets of one and the same class. In class number, it is denoted by a prescribed connecting symbol. For example, in the class number given already, the facet relation is denoted by the symbol colon and represents Energy Facet Relation.

Compound Class is a class which has at least one facet. For example, the class given already as an example is a compound class with two facets.

Phase Relation is the relation between two classes studied together, or figuring in the same class or subject of study, and either of which may be a basic class or a compound class. Complex Class is the class which brings two classes into phase relation. For example, the class "Agriculture for Economists" is a Complex Class. In it, Agriculture and Economics are Phases. The phase relation between them has been called Bias Phase Relation. This is because it denotes the exposition of Agriculture, with such details and in such manner only, which will be of help to a reader whose special field of study is Economics. Again, the class "Difference between Agriculture and Botany" is also a complex class. In it, Agriculture and Botany are Phases. The phase relation between them has been called Difference Phase Relation.

Intra-Facet Relation is relation between two isolates in one and the same facet of a class. This will be illustrated at the end of this paper.

2 FACET RELATION

21 Decimal Classification

Generally speaking, DC enumerates only Basic Classes and Compound Classes with a single facet. This is largely the result of notational exigency. The concept of non-substantive, purely connecting symbols had not taken shape in the pioneering days when the DC was designed. Therefore, a change in the train of characteristics was not possible unless the first train was totally arrested. Occasionally, an unconscious transition from one train to another happened; even then, the first train is arrested from further growth. But in most cases, the schedule enumerated the isolates based on different trains of characteristics as co-ordinate isolates. Thus DC seldom tackled the problem of Facet Relation in the notational plane. It did not provide for non-substantive connecting symbols.

22 Universal Decimal Classification

UDC postulated Quotation Marks, Brackets, and the Equals-Sign as connecting symbols, without values of a substantive nature to represent isolates or basic classes. This enabled it to postulate Time, Space, and Language Facets respectively. Each of these facets admitted of being attached to any host class. Each of these isolate numbers could grow in length - that is represent isolates of decreasing extension - without arresting any other facet of the host class. Thus facet relation appeared for the first time in UDC. But it was only to a limited extent. For, UDC adopted DC as its core. Among the classes already included in the schedules of DC, UDC was not able to provide for facet relation. This meant in effect that UDC could not provide for facet relation between personality, matter, and energy facets. However, wherever

DC had not provided compound classes with energy isolates, UDC introduces provision for facet relation of energy facets, by the device of Analytical Numbers.

23 Colon Classification

CC was the first scheme to be built from the start avowedly on the basis of Facet Analysis and Facet Relation. It has the least of a rigid core. It does not thwart the class number of a class admitting of any number of facets, with full freedom for each facet to grow independently of the others. It increased the potency of its notational mechanism for facet relation by postulating four connecting symbols in its edition 3, in the place of a single connecting symbol of the first two editions. The concepts of Level and Round, developed in edition 4, have increased its versatility by making it possible to represent any number of facets that may be presented by a class of a very specialised nature. Thus, its notational plane is able to keep step with the findings in the idea plane.

3 IMPROVISATION

31 Decimal Classification

When a class presented two different facets, the technique of DC is to ignore one of them and to represent only the other facet in the class number. Differences arose among the practitioners of DC with regard to the facet to be ignored. DC itself did not give any guidance in the matter by specific rules. Merrill collected, in his Code for classifiers, a comparative statement of the differing practices. But he too did not arrive at any guiding principles.

32 Universal Decimal Classification

UDC improvised a notational technique to make a class number co-extensive with the class and expressive of all its facets. It prescribed,

1 Constructing two different class numbers, each representing only one of the two facets; and

2 Combining the two class numbers with the colon as the connecting symbol.

But, it did not make any definite prescription about the sequence in which the two class numbers should be combined. This naturally opened the door for the fault of homonym in the language of class numbers. A convention is sometimes used. The class number, lower in the ordinal scale, should be the earlier constituent in the resulting class number. But this prescription does not respect the Principle of Increasing Concreteness consistently. This principle is known to secure conformity to the Canon of Helpful Sequence.

33 Colon Classification

No doubt the CC has had a notation from the very beginning, which was capable of implementing facet relation and producing co-extensive and expressive class numbers. In the earlier editions, in which only a limited number of facets were envisaged, an ad hoc facet formula was prescribed for each basic class; and this formula happened in most cases to secure conformity to the Principle of Increasing Concreteness. The formula for Chemistry and Law were faulty in the first edition; but it was rectified in later editions. It was also the case in the basic class Library Science. These mistakes demonstrated that dependence on flair was not dependable in all cases. The decision about the sequence of facets ought to be taken at a much deeper level once for all and not left to be taken separately for each basic class. This necessity was re-inforced when provision was made for an unlimited number of facets in a class. The situation was met by the postulate of the Five Fundamental Categories, and of the relative concreteness among them. This investigation was continued for a few years in the Annals part of the Abgila, 1 to 3, 1949 to 1953, in the series of articles entitled Optional facets. The residual problem still baffling solution is the prescription of a fool-proof criterion to recognise particular facets as manifestations of personality, matter, energy, space, or time. Constant experience does give some insight into this problem, in particular cases. But, this is not sufficient either for communication among classifiers or even for unerring decision in some subjects. This needs further study.

34 Example

Subject:	Physiology of flowering plants
DC No	581.1 or 582.41
UDC No	581.1:582.41 or × 582.41:581.1
CC No	I5:3

The awkwardness due to long number is seen in the UDC number, because its DC core allows only the improvisation of coloning entire class numbers, instead of connecting only the isolate numbers as in CC.

4 PHASE RELATION

41 Decimal Classification

When two classes were brought into phase relation and resulted in a complex class the earlier editions of DC had no provision to arrive at a class number co-extensive with and expressive of the complex class. Edition 13 faced this situation. It prescribed .0001 as the connecting symbol to bind the class numbers of the two phases together and thereby give a co-extensive and expressive class number to the complex class. It treats all phase relations alike.

42 Universal Decimal Classification

UDC used colon as the connecting symbol. It is no doubt used also for indicating facet relation. But in most cases, distinction between the two kinds of relations is easy. For, in facet relation, the basic class numbers of both the class numbers forming the phases will be the same. But, they will generally be different in the case of phase relation. UDC too does not distinguish between different phase relations. It treats them all alike.

43 Colon Classification

CC used zero as the connecting symbol to show phase relation. This was in the earlier editions. This provision was made in quite a casual way, without any conscious thought about phase relation or the possible varieties of such a relation. The term Phase Analysis was used for the first time, only in 1943. This term was the heading of Part 3 of my Library classification: Fundamentals and procedure (1944). But even at that time, a clear view of phase relation had not emerged. Consequently mistakes were made.

44 Anteriorising Common Isolate

Anteriorising Common isolates were hastily described as one class of secondary phases; it was further said that they were not in need of a connecting symbol in being attached to the host class number or the first phase. We now know that an anteriorising common isolate belongs only to a facet. The whole of chapter 31 of the Fundamentals should be transferred to Part 2 devoted to Facet Analysis.

45 Energy Isolate by Subject Device

Similarly, an energy isolate got by subject device was hastily described as another class of secondary phases. The connecting symbol prescribed for this was colon, the connecting symbol to denote energy facet. This was called tool phase relation. We now know that the number got by subject device belongs only to a facet and not to a class.

46 Causes of the Mistakes

These mistakes arose out of the absence of a careful definition of phase relation, such as the one now given in this paper, or the one given in the edition 4 of the Colon classification (1952). Therefore, much progress could not be made in phase analysis till after 1952.

5 CORRECT PHASE RELATIONS

51 Bias Phase

Of the three kinds of phase relations described in the Fundamentals, only one stands the test of the present definition. It is the Bias Phase Relation. Here, the exposition of the first phase is biased towards the second phase. That is, the first phase is expounded with such details and such examples only, as will be of interest or of use to one whose chief field of study is the subject forming the second phase. It was only for this relation that zero was used as the connecting symbol.

52 Influencing Phase

However, soon after the Fundamentals was published, P K Garde brought to my notice, in one of my visits to Bombay, books on Geopolitics. It was a case of the study of Political Science, a basic class, as it is influenced by Geography, another basic class. To number it as W0U mixed it up with books on Political Science with a bias to Geography. This led to the recognition of a new relation, which we agreed to call Influencing Phase Relation. I had called it Garde Phase in my *Elements of library classification* (1945). The chief difficulty was in the choice of a different connecting symbol for this phase relation. We wished to have it nearest to the general treatises on Political Science. We had no notational device in those days, to secure a posterior place; for that had been occupied by the books with bias relation, for which the connecting symbol zero had been used. Therefore, we could only think of an anterior place. z8 (Roman small z followed by 8) would give the nearest possible anterior place. It was therefore chosen as the connecting symbol for the influencing phase. That this was faulty will be seen in the next section.

53 Comparison Phase

About 1948, depth classification of micro thought came to be practised in connection with the course in Documentation given to the students of the M Lib Sc class of the University of Delhi. This made us realise the appreciable literary warrant, in the world of micro documents - that is, articles in periodicals and tiny pamphlets containing lectures - for complex classes in which one class of knowledge was compared with another. We were led to recognise this as a new kind of phase relation. We called it by the descriptive name Comparison Phase Relation. This too needed a place near to general treatises in the first phase. Then, we realised that any *ad hoc* improvisation would not do. Other phase relations might come to be isolated. This led to the thought that the connecting symbol for any phase relatin should be zero. That alone will give to the complex classes formed by phase relation a posterior position next to that of the general treatises. Having decided this, the Roman small c suggested itself as the specific digit to represent the specific phase relation of Comparison. There was another difficulty in this case. In the two earlier kinds of phase relations, the subject of exposition was obvious and it was possible to prescribe it as the first phase. But in Comparison Phase Relation, both the phases were on an equal footing. To prescribe for a unique choice, it was decided to choose as the first phase that class whose class number was the smaller ordinal number. All this has been discussed in detail by the lamented Koranne in the *Annals* part of the *Abgila*, 1, 1950.

54 Present Position

In spite of this experience, it did not occur that the Bias Phase Relation also should be brought into line with this idea. The case of Influencing Phase Relation was immediately rectified by using zero as the connecting symbol and the Roman small g as the specific digit for denoting that specific phase relation. But even in the edition 4 of 1952, the *Colon classification* prescribed only a bare zero to link up the class numbers of the two phases in the case of bias relation. Conservatism also led to the retention of the so called tool phase. Now it is clearly seen that we may venture to make the changes. Accordingly the forthcoming edition 5 incorporates the latest ideas. It has also provided for two other kinds of phase relation - the general relation and the difference phase relation.

55 Rules about Phased Class Number

Rule 8203 of edition 5 reads: "The Class Number of a Two-Phased subject is got by inserting 0 and an appropriate digit representing the phase relation, between the Class Numbers of the First and the Second Phases". Chapter 8 of the Schedules gives the following schedule of phase relations:-

a	General
b	Bias
c	Comparison
d	Difference
g	Influencing

56 Universal Decimal Classification

The phase relations are not the creation of CC. Indeed they are not the creation of any scheme of classification. They are intrinsic to the world of expressed, recorded thought. They occur in the idea plane itself. It is the duty of any scheme of classification to implement this finding of the idea plane, in constructing class numbers in the notational plane. The indication of the idea plane, that such complex classes should come immediately posterior to the treatises on the subject forming the first phase, appears to be helpful. "Immediately posterior" means "Before any subdivision of the subject forming the first phase, derived on the basis of a characteristic". If this decision in the idea plane is accepted, some method must be found for the UDC to implement this decision. The following prescription is recommended for consideration by the UDC Committee of the FID:-

The UDC number of a two-phased class should be obtained by inserting a colon and an appropriate digit representing the phase relation, between the class numbers of the first phase and the second phase. The digit for phase relation may be a Roman small as given in the schedule in section 55.

The adoption of this prescription will not come in conflict with any of the existing rules governing the UDC or the current practice.

57 Why Roman Small?

The prescription of Roman small to represent phase relation is just to distinguish it from every other species of substantive digit in use. No difficulty can be thought of as arising out of this in UDC. In CC too, no difficulty can arise in spite of its using a Roman small for a common isolate. If the common isolate is an anteriorising one, it will be preceded by some other species of substantive digit - a numeral or a Roman capital. If it is a posteriorising one, it will be preceded by a punctuation mark. But when it represents a phase relation, it will be preceded by a zero. It may also be stated that closest proximity will be secured to the subject forming the first facet for the following reasons:-

1. The postulate that any connecting symbol is lower in ordinal value than any substantive digit, that is than a. (See rule 0253 of edition 5 of the *Colon classification*) and

2. Of all the connecting symbols, zero has the least ordinal value. (See rule 0252).

58 Examples

Subject	CC No	Proposed UDC No	Old UDC No
Psychology for teachers	S0bT	159.9:b37	159.9:37
Influence of psychology on education	T0gS	37:g159.9	159.9:37
Demonstration of the application of psychology in teaching	T:S	37:159.9	159.9:37

6 INTRA-FACET RELATIONS

61 Concrete Cases

Subject	Old CC No	New CC No
Difference between Analytical Conics and the Projective Geometry of Conics.	B622:20dB622:7	B622:20n7
Influence of Projective Geometry of Conics on Analytical Conics	B622:20gB622:7	B622:20r7
Comparison of Buddhist Rituals with Christian Rituals	Q4:450cQ6:45	Q40m6:45
Influence of Buddhistic Rituals on Christian Rituals	Q6:450gQ4:45	Q60r4:45
Tariff relation between India and Great Britain in the 1950's	X:53.44056.N5	X:53.440a56.N5
British Preference in Indian Tariff in the 1950's	X:53.44056.N5	X:53.440k56.N5
Difference between Rural and City Festivals	Y31:360dY35:36	Y310n35:36

62 Old vs New CC Number

In the first four cases and the last the new CC Number is shorter than the old. This economy is due to the avoidance of repeating the basic class and one of the facets in the new CC Number. This new notational device did not suggest itself for years, since the need for economy was felt in 1943. But even now, one is not quite sure that the interpretation of the new class number into the name of the subject shown against it is a natural one. But we can adopt this interpretation by convention, provided that no other intelligible interpretation is possible. About this, there is need for experiment and experience.

63 Modified Bias

In the fifth and the sixth cases, however, the new CC Number is one digit longer than the old. The old number merely connected the two isolates in the space facet by the then connecting symbol for bias viz Zero. This was called Modified Bias Device. in the Fundamentals. But now we have realised that bias is not the only possible kind of relation between the isolates. The extra digit has been made necessary in order to individualise the various kinds of relations between the isolates. This is quite unavoidable, as the new number has become more fully expressive.

64 The Schedule for Intra-Facet Relations

The relation between two isolates of one and the same facet of a basic class is called Intra-Facet Relation. To every kind of phase relation, there corresponds an intra-facet relation. The schedule for the latter is:-

j	General
k	Bias
m	Comparison
n	Difference
r	Influencing

The new isolate formed by combining two facets in the same facet of a class, so as to express the relation between them, is called a Complex Isolate.

65 Universal Decimal Classification

Though a simple device has been suggested to construct co-extensive, expressive UDC numbers for a complex class, it has not been possible to prescribe a similar device to have coextensive, and expressive UDC number for a complex isolate. This is due to the absence of clear cut facets and isolates in UDC., in general. However, the presence of a clear cut space facet and isolates, makes it possible to distinguish the different intra-space-isolate relations by adding a relation number, taken from the schedule in section 64, after the colon within the space facet. This suggestion is recommended to the FID Committee on UDC. But in the other cases, where there is no clear cut facet and the intra-facet relation figures in the notational plane as if it were phase relation, the schedule in section 55 may be used instead of the one in section 64. This difference in treatment in the notational plane for one and the same phenomenon in the idea plane is an additional proof for the need for basing UDC on a full instalment of facet analysis, including personality, matter, and energy facets also. This is also brought out by the structure of the UDC numbers for the subjects given in section 61 and by the far-fetched way in which they have to be constructed to attain co-extensiveness and expressiveness. The UDC numbers are given in the next section, as far as they could be managed.

7 AUTO-BIAS DEVICE

The proposed notational technique to represent intra-facet relation does not come in conflict with the Auto-Bias Device, in which also the isolate within a facet is formed by the combination of two isolates in the same facet. The rules on the latter are given as follows in edition 5 of the Colon classification.

6880 When an isolate is not scheduled in a facet but can be got by combining two of the scheduled isolates, it is called an Auto-Bias-Isolate.

6881 The Number of an Auto-Biased Isolate is got by the Auto-Bias Device.

6882 The auto-bias device consists in connecting the numbers of the constituent isolates by a hyphen.

For example, in the personality facet of Y Sociology, 11 is Children, 31 is Rural Group, and 35 is City Group. Then, 11-31 is Rural Children and 11-35 is City Children.

71 Difference between Auto-Bias Isolate and Complex Isolate

The auto-bias isolate does not stand for any intra-facet relation between the constituent isolates. It only stands for an isolate of smaller extension than either constituent got by a lamination of one over the other. This lamination is quite like the lamination of one facet of a basic class over another. By extending the analogy, we may call the isolate got by lamination of two isolates in the same facet a Compound Isolate, in contra-distinction to the Complex Isolate got by combining the isolates by the device for intra-facet relation. Thus, the auto-bias isolate and complex isolate stand for totally different concepts in the idea plane.

72 Versatility

The involved subjects used for illustration in the various sections do have literary warrant in the universe of micro documents, embodied as articles in periodicals, and as monographs of research. The Depth Classification to be used in Documentation Work should be able to provide co-extensive and expressive class number for them. These class numbers should implement the helpful sequence fixed for them in the idea plane. These subjects involve in the idea plane itself phase relations, intra-facet relations, and auto-bias isolates. It is the duty of a scheme of classification, used in documentation work, to implement all of them in the notational plane. It is believed that the notational devices set forth in this paper adds appreciably to the versatility of a scheme of classification.

8 A NEW PROBLEM

Will a complex class behave like a basic class and demand distinctive facets of its own? It is difficult to say now. If literary warrant develops leading to such a demand, the arrester bracket should be added after the complex number and then facets can be added to it, as demanded by the complex class.

DEPTH CLASSIFICATION

22 FIELD OF KNOWLEDGE IN RELATION TO TEXTILES*

S. P. PHADNIS and HASMUKH PATHAK

ATIRA, Ahmedabad

Analyses some abstracting periodicals in Textiles to study their subject coverage. Selects three different years - 1924, 1938, 1954 - for making a comparative study. Shows the procedure followed in making the study.

In the field of textiles, the following periodicals give either indicative or informative abstracts, while some of them give only author, title and references. It may be that some provide few pages while others are entirely devoted to abstracting.

1 AKU Documentation
2 ATIRA Textile Abstracts
3 British Cotton Industry Research Association - Summary of Current Literature
4 Bulletin de l'Institut Textile de France - Documentation et recherche
5 Classified Contents List
6 Coton Et Fibers Tropicals - Bulletin Analytique
7 Empire Cotton Growing Review
8 Hosiery Abstracts
9 Journal of the Society of Dyers and Colourists - Abstracts
10 Journal of the Textile Institute - Abstracts
11 Kunstseide und Zellwolle
12 Melliand Textilberichte
13 Natural and Synthetic Fibers
14 Review of Current Literature
15 Teintex
16 Textile Journal of Australia
17 Textil Praxis
18 Textil Rundschau
19 Textile Technology Digest

After proper considerations, we selected the following four abstracting periodicals covering different regions in the field of textiles.

1 Journal of Textile Institute (Abstracts) : General
2 Journal of Society of Dyers and Colourists (Abstracts) : Wet Processing
3 Natural and Synthetic Fibers : Synthetic Fibers
4 Empire Cotton Growing Review (Abstracts) : Cotton Growing

To have an idea about the different subjects covered by these periodicals, we first analysed the list of periodicals abstracted by each. For this, the titles of periodicals were classified by using the Colon Classification. The pattern represented by three out of these abstracting periodicals are given in Chart A.

---

* Paper read and discussed at the First Conference of the Indian Association of Special Libraries and Information Centres (IASLIC), April 10-11, 1956, and the abstract published in the IASLIC Bulletin.

FIELD OF KNOWLEDGE IN RELATION TO TEXTILE AS REPRESENTED IN DIFFERENT ABSTRACTING PERIODICALS IN THE FIELD OF TEXTILES

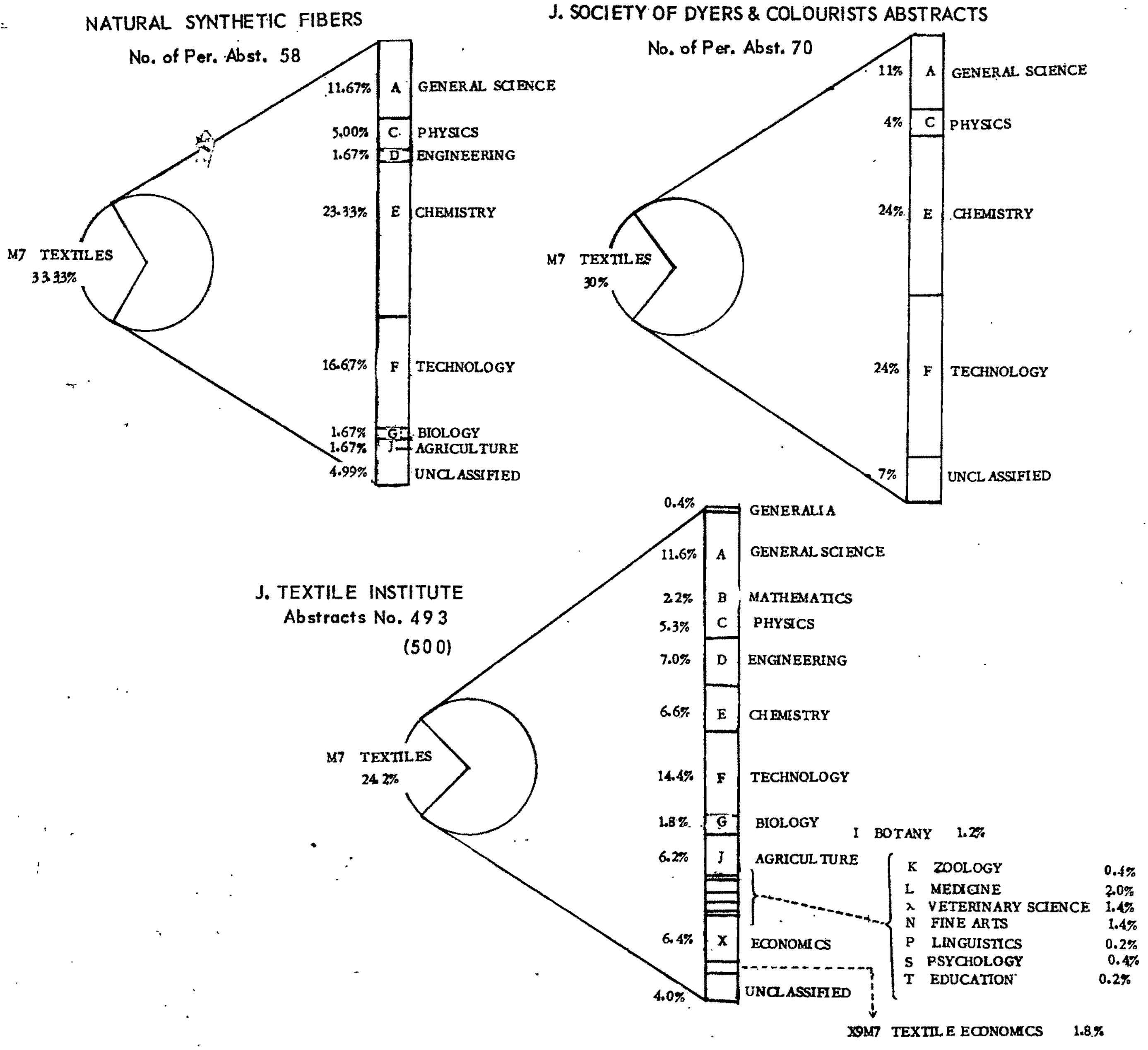


TABLE 1: J.T.I. Vol. 15, July to December 1924

No.	Classification Nos.	Subjects	Nos. of abstracts
1	B28	Statistics	2
2	C	Physica	24
3	D	Engineering	320
4	E	Chemistry	94
5	F	Technology	59
6	G	Biology	1
7	H	Geology	2
8	I	Botany	10
9	J	Agriculture	94
10	λ	Animal Husbandry	1
11	L	Medicine	4
12	M	Useful Arts (other than M7)	10
13	M7	Textiles	544
14	T	Education	1
15	X	Economics	124
16	Y	Sociology	1
		Total	1291

TABLE 2: J.T.I. Vol. 45, July and December 1954

No.	Classification Nos.	Subjects	Nos. of abstracts
1	A	General Science	5
2	B28	Statistics	6
3	C	Physics	5
4	D	Engineering	257
5	E	Chemistry	128
6	F	Technology	56
7	G	Biology	1
8	J	Agriculture	38
9	λ	Animal Husbandry	7
10	L	Medicine	2
11	M	Useful Arts (other than M7)	3
12	M7	Textiles	501
13	T	Education	6
14	X	Economics	78
15	Y	Sociology	1
		Total	1094

Further, it was decided to analyse from three different years, the articles appearing in above abstracting periodicals. The years chosen are 1924, 1938 and 1954 respectively.

This paper is presented to give our method of approach and some indicative conclusions as our work on it is still continued. In this, we have analysed the abstracts appearing in the Journal of the Textile Institute for the year 1924 covering the period July to December having about 1200 abstracts and July and December 1954 having about 1100 abstracts.

In this paper we have utilised the modified schedules of Colon classification prepared by us.

The procedure we follow for the analysis is as follows:

The articles were classified according to the scheme and separated according to each group. The entries in each group were counted and finally the totaling was done for the different general subjects. Totals are presented in table 1 and 2. As the sample is very small and the work is in progress we cannot draw any valid conclusions but the trend is as follows:

(a) There is an increase of more articles appearing on following subjects:

1 Statistics

2 Cellulose Chemistry

3 Dyestuffs

4 Finishing

(b) Articles on different new fibres like polyamide (Nylon-Perlon), polyester (Decron-Terylene), Protein (Ardil), Vinyl and Acrylic, are appearing in 1954.

(c) There is a marked decrease in articles on agriculture in 1954.

Remarks about the Scheme:

In this specific case, the most scientific classification of the subject was to be given precedence over the traditional ones, e.g. the fibers are classified according to their chemical nature which were previously classified as natural fibres, vegetable fibres etc.

It also confirms the idea that individualistic separate scheme for different subjects are not useful as new different subjects are coming into play and we have to use the core of a more general scheme and modify it further for the specific subjects.

In the preparation of this paper, a good amount of help and collaboration was given by Miss Madhuri Trivedi and Mr. J.R. Pandya.

OPEN ACCESS IN LIBRARY*

2 DEFINITION, SCOPE & HUMANISTIC VALUE

S. R. RANGANATHAN

Defines Safe-Guarded Open Access. Explains the need for it in libraries for specialists, general public and students. Shows the futility of arguments of mutilation, misplacement and wear and tear of books, against open access. Examines the increase of probability for theft. Shows from the analogy of business practice, technology, and thermodynamics that the slight extra risk is price worth paying for the social benefits of open access. Works out the need for classified arrangement and for plenty of mobile guides and the doubling of stack-room space in open access. Refers to an electrically operated compact stack-room possible in a research library, saving 70% of space. Recommends for the limit of tolerance for the writing off of books, one book for every 1, 000 issued for use. Concludes with an examination of the humanistic value of open access.

2 WHAT IS OPEN ACCESS?

All the statements in sections 11 to 18 and their subsections of my article on Open access in library (1) published in An lib sc 3, 1956, 11-15 will be assumed to be valid statements, in the discussion of open access. We shall begin with a provisional definition. "Open Access" is the library practice of admitting a reader to the stack-room, allowing him to browse among the books on the shelves, and giving him freedom to pick out from the shelves the books needed by him either for study in the reading room or for getting charged at the counter for study at home. There are however some controls.

21 Physical Control

In the first place, entry into an open access library is only through a wicket gate. Similarly, exit from it is also through a wicket gate. The wicket gate is controlled by the staff within the counter-enclosure, charging and discharging books on loan. This reasonable vigilance is exercised at the entrance and exit to prevent unauthorised removal of books from the library. For the same purpose, all the other openings on the outside walls - such as doors and windows - are fitted with shutters of glass and/or of closely woven weld-mesh to prevent books being passed out through them. These two measures form a reasonable physical control over the possible form of abuse of the privilege of open access. Habituation to open access through a couple of generations is leading some libraries in the West to do away with the wicket gates.

22 Control by Exclusion

Secondly, all abnormal documents, indicated in section 115, are excluded from open access. They are kept under lock and key. Books of considerable money value may tempt an unscrupulous reader to steal them; pamphlets and miniature books may tempt a reader to hide them in the clothes and smuggle them out; a rare book may tempt a reader to become so selfish as to take it away without being charged; a book of unusual bibliographical or sentimental interest may fall a prey to the cleptomania of a bibliophile. To prevent any such abuse of open access, control by exclusion of such categories of abnormal documents from open shelves is regularly practised by all libraries with open access.

---

* Continued from *An lib sc* 3, 1956, 15.

23 Human Control

Thirdly, an open access library provides a squad of genial reference librarians, to help readers in the choice of books for study. They are always within easy call of every reader in the stack-room. Incidentally this also implies that a reader does not go out of the sight of reference librarians for any long interval. This factor exercises a two-fold control over abuse of open access. In the first place, the genial and intimate help given by the reference librarian induces in many readers a friendly attitude towards the library. Secondly, the frequent passing to and fro of the reference staff and other staff such as cleaners reduces the time interval of a reader being left out of observation and with opportunity for malpractice. This control, which is human, is not as foolproof as the physical control or control by exclusion. For, human consideration and influence are too intangible to weigh with born or confirmed criminals. However, it reduces the chance for the abuse of open access, in a considerable measure.

24 Control through Detectives

Some large libraries perhaps the New York Library practises it occasionally - seek to minimise harm by criminals, by employing some detectives either permanently or at intervals. These are trained in criminal psychology and preventive methods. Of course, they do not belong to the library profession. But, they work in co-operation with the library staff. They spot out suspicious readers and take steps to increase vigilance on them. This control is not however feasible in small service libraries. And small service libraries are much more numerous than large ones. The only compensation is that the smaller the library the greater is the chance for the library staff to know each reader fairly well and for the public in general developing a sense of ownership in their library and helping in the prevention of abuse by the unscrupulous few.

23 Definition

Open Access:— The library practice of 1 giving a reader freedom to have direct access to all the books in the library, except the abnormal documents kept under lock and key; 2 giving him reference help in the choice of reading materials; 3 permitting him to pick out from the shelves any book needed by him either for study in the reading room or for being charged at the counter for study at home; 4 not allowing him to put back books in the stacks; 5 designing the library building such that there is only one point for entry into and for exit from the library; 6 keeping strict vigilance at these points, often with the aid of wicket gates under the control of the staff within the counter enclosure doing charging and discharging work; 7 treating the windows and the other doors in the outer walls of the building, say with shutters of glass and/or closely-knit weld-mesh, so as to prevent books being passed through them; and 8 securing the over-all organisation of the building, the distribution of the staff in the stack-room, and their work within it, such that a reader is not left in the stack-room too long out of the sight of some member or other of the staff.

This vigilance is exercised with particular care over readers too weak to resist temptation to abuse the privilage of open access. To underline the provision of all such controls, it is usual to speak of "Safe-Guarded Open Access".

26 Net Result

The net result of safe-guarded open access is that a reader has practically as much freedom in the selection and use of the books in a library as he has in his own private collection. There is restriction and visible vigilance only at the entrance and exit gates. To have unimpeded freedom within the library itself, a reader must submit himself to this restriction.

There is help in the stack room in the choice of books. As an inevitable concomitance, this factor provides some unseen vigilance. Every reader is able to choose his books from out of a large collection which he can handle and glance through; this gives immense satisfaction to the Second Law. The chance for every book catching the eye of some reader or other is increased considerably; this gives immense satisfaction to the Third Law. The reader need not fill up forms for books and wait in idleness till their arrival. Subjectively, the reader does not experience any loss of time; this gives satisfaction to the Fourth Law. Open access is a help to the fulfilment of the First Law too. The second function of a library is better discharged with open access than without it. At the same time, the first function of the library is also provided for by denying open access to abnormal documents. Taking the library system of a country as a whole, the dormitory libraries are largely left to look after the first function in its fullest measure. Open access is not allowed in such libraries. This policy of differentiation of libraries in respect of open access is of help in enabling the discharge of the functions 2 to 8 effectively by the service libraries.

3 WHY OPEN ACCESS?

The reason for open access in a library varies with the kind of readers and the type of libraries. Viewed from this angle, we shall recognise three kinds of readers viz Research Worker, General Public, and Student. So also we shall recognise three types of libraries viz Business Libraries, Public Libraries, and Libraries of Educational Institutions. In each of these cases, three factors determine the need for open access.

31 Research Worker

We shall first examine the why of open access in business and research libraries. Such a library has usually a small collection. It is of a specialised nature. The documents are usually of an advanced standard in its field of specialisation. They often embody nascent thought. Much of it is new at the moment. It is difficult to lay bare the "individuating peculiarities" of nascent thought. It takes time for them to take recognisable shape. But in the meantime, its value is at its greatest. Classification and cataloguing can not bring out the true value. But a research worker in the field concerned can get the feel of it. For, he belongs to the uppermost quartile in the intellectual scale.

311 Psychology

Naturally a person working in the wave-front of a particular field of knowledge, has his mind well soaked in the problems of his field. Browsing among the documents on the shelves and in the vertical files make the documents convey to him far more of their subtle and intangible suggestions than merely the titles, class numbers, or even abstracts can. For, he is greatly sensitive to the new suggestions and the inexpressible qualities of the documents in his field of specialisation. When he is out to look for his exact document, his awareness is extremely concentrated and intense. Even the slightest hurdle causes pain. Denial of access to the collection of documents certainly does so. On the other hand, direct and unimpeded access to the documents likely to give the mental pabullum needed gives comfort and increases creativeness. The particular document which will release the trigger, as it were, is unpredictable. The tense muscles, the absent-minded face, and the gleam in the eyes of a research worker gliding into the library show that nothing else exists in the field of his attention, except the specific topic of his pursuit. It is a crime to deny a person in such a psychological state direct access to his documents, which he alone can find out. The Second Law is at the height of its insistence in this case. For it is essential that the research potential of humanity should be fully used for the benefit of society. Thus according to the Second Law, open access is an imperative necessity for a research worker and in a business or a research library.

312 Time Factor

Most of the members of a research team are not creative enough for the need for a document to be felt as a compelling one. In them, the mood for research should be kept up by providing freedom to pick out the right document, before the fleeting urge to use it fades away. No time should be lost in the reader getting his document. Here it is loss of subjective time that is more damaging even than that of objective time. Open access saves subjective time. The Fourth Law is at the height of its insistence in this case. This too stems from the need to harness the research potential of humanity in the fullest measure. This is easily conceded by authorities of business libraries. For time is greatly valued by them. Moreover, productive use of a document is paramount with them. They are seldom interested in the hoarding of documents. Taking risk is of the very essence of their way of life. They are therefore prepared to face any risk of open access. For they are keen to save the time of the research worker in getting at his document. They are keen to get his mind irradiated by direct contact with the totality of the documents in his field and radiate new thought without any loss of time. Thus, according to the Fourth Law, open access is an imperative necessity for a research worker and in a business or research library.

313 Nature of Documents

Any expression of thought has many subtle facets. It is particularly so in the case of nascent thought. Any such subtle facet transcends tell-tale exppression. It can be sensed only by a specialist in the field who can resonate with it. The title cannot disclose it. The class number cannot bring it out. It is not possible to pin down in an abstract all the imponderable scintillations of a contribution by an original thinker. And yet, it is these scintillations that can catalyse creative work. The Third Law is not satisfied until every document gets the proper reader for each of its subtle facets to exercise its creative stimulus. Without this happening, a document does not realise its destiny. It is often a tiny statement in a document, occupying perhaps a small paragraph or even a sentence only in some book, or periodical or pamphlet or clipping that can act as the ferment. This is so personal. Open access alone can increase the chance to bring the ferment into action. And a document is really wasted unless it comes into action. Thus, according to the Third Law, open access is an imperative necessity for a research worker and in a business or research library.

32 General Reader

We shall next consider the why of open access in public libraries. Such a library has usually a larger collection than a business library. It has more of books embodying macro thought than micro documents. Its books are of a general and comprehensive nature rather than specialised. Many of its books are relatively cheap. Many of them lose their value in a relatively short time. It is so in the case of many recreative, informational and other pedestrian books. Any work of lasting value is usually brought out in new editions from time to time. Its readers are not specialists. Even a specialist going to it goes only for general reading. The lower quartiles in the intellectual scale abound among its readers. These form the great concern of a public library, in order that functions 2, 3, 4, 7 and 8 of the library system of a country may be carried out.

321 Psychology

Reading is an intellectual act. The thought-content of a book has to permeate into the personality of the reader through the intellect. Even a book rich in emotional appeal has to begin its approach via the intellect. It is so to some degree even with a book appealing to the vulgar passion and creating addiction. This intellectual inevitableness in the working of a book on a reader is heightened by the medium of phonetic symbol in which thought is recorded. It is only an indirect record of thought. Many intellectual mediations have to be gone through, before the thought in the book gets delivered in the mind of the reader and either activates it or relaxes it. For an intellectual, this is all done in a trice as a mere reflex action. The intellectual may not therefore realise the tortuous and difficult process involved in the reading by a general reader of the lower quartiles in the intellectual scale. A librarian in a public library should know it. Denial of open access adds to this tortuousness. It puts a further hurdle between the reader and his book. On the other hand, open access gives the chance to taste several books rapidly and with the help of a sympathetic reference librarian, as a preliminary step. This minimises the chance for the book finally chosen for study proving repulsive. It increases the probability for reading being liked. Again, intellectual hunger is very different from physical hunger. The latter is compelling. The former is not. In physical hunger, the biochemistry of the body of the person sees to it that he does not rest until he gets his food. On the other hand, there is nothing to make a person pursue his intellectual food with equal tenacity until he gets it. One is not prepared to undertake much effort in the matter. Intellectual hunger is very feeble. Intellectual food has little chance to be accepted unless one is immersed, as it were, in a sea of books and is further coaxed by a sympathetic helper. This is what open access seeks to do for the general reader. For psychological reasons then, the First Law and the Second Law insists that open access is an imperative necessity to a general reader and in public libraries.

322 Time Factor

The urge to enrich thought by reading books, the mood to find elevating private recreation by reading books, and even the desire to look up a ready reference book for information, - each of these is too fleeting for many a reader. Intellectual inertia asserts itself within a short while after intellectual curiosity is roused. The Fourth Law therefore insists on making hay in the split second when the sun shines. It insists on the time of the reader being saved while he chances to come to the library. Its primary insistence is on the saving of subjective time. Open access does it admirably. For, it keeps the reader busy from the moment of entering the library till the last minute when he takes the right book away for study in the reading room or at home. There is no boredom of passively waiting. How often a reader slips out of the library unnoticed, boredom makes him do so without waiting for his book. Repetitions of such an experience prevent the reader from going to a library any longer. Even loss of objective time may go beyond the limit of tolerance. This should happen in a public library without open access, if it is as populous as it should be in a democracy. Considerable time will be required to collect all the books applied for by readers and deliver them at the counter. The time will be appreciably great, even with the use of mechanical contrivances such as vacuum tubes and conveyer belts. Take for example a Saturday afternoon or the evening of a week-day. Hundreds of workers will turn up at the library more or less simultaneously. Even with open access, the mere passage of readers one after another through the entrance and exit gates will involve much loss of time. Without open access, the time lost will mount up considerably. This will discourage readers visiting the library. Thus, from the angle of subjective as well as objective time and according to the Fourth Law, open access is a great help and even essential to a general reader and in a public library.

323 Nature of Books

The books on one and the same subject vary considerably in standard, style, flair, illustrations, and the degree of thoroughness or selectiveness in subject coverage. The specificity of these qualities of a book is as varied as the specificity of the features of the face or the timbre of the voice of a person. It is good that it is so. For varied are the tastes of persons, as the saying goes. No classification and no catalogue can bring out these ineffable qualities of a book. Even the best and minute classification can only indicate the subject-content. The other qualities of a book are too unascertainable, too impermanent, too relative to readers and too intangible to be represented uniquely by a class number. Even the annotation in its catalogue entry can not clinch these qualities with precision. Matching the specificity of a reader with the specificity of the books in exact measure is the function of reference service. This cannot be done properly unless the reference librarian can have the collection of books and the reader in juxtaposition. Book after book will have to be tried with the reader before the fitting book can determined. This is equally true in the case of the self-reference-work by a reader. Also many a book may not get the right reader, or even any reader at all, unless readers can browse among the books in the stack room.

Thus, according to the Second Law and the Third Law, open access is of great help and even essential to a general reader and in a public library.

33 Student

All the arguments for open access to a general reader hold good in the case of a student reader also. There are some additional reasons for open access in the library of an educational institution, be it a school, college, or university. There are immediate as well as remote reasons for this. The immediate reason is educational and individual. The remote reason is civic and social. All these reasons hold good in any library serving children and adolescents, whether it is attached to a public library or an educational institution, or is unattached and independent.

331 Implication of Democracy

Democracy withholds political rights from children and youth. But, as if to compensate for this, it shows extra solicitude to the child's right to physical nourishment. For example, the first claim on the milk available in a community goes to children. When I was in Great Britain in 1948, there was shortage of milk. I found it all reserved, in order of preference, for children, pregnant women, invalids and old persons. We have read that the poverty-stricken Kuchela and his wife would feed their numerous children with whatever food could be collected, even to the point of starving themselves on many days. According to democracy, similar extra solicitude should be shown to the child's right to mental nourishment. This implies a right to books. In conformity to this demand of democracy, special children's books are now being brought out on every conceivable subject, to suit different mental levels. During the first eighteen or twenty years of life, the rate of mental growth is very high. Therefore, the standard, the style, and the other intangible qualities of children's books have to vary much from one age level to the next. Perhaps, about eight such levels may have to be recognised. The matching of the right books to a child is not therefore, easy. It is not determined by the easily ascertainable physiological age. For, the psychological age does not keep step with it. There is another complication. A child does not have the same psychological age in relation to every subject. At the same time, its curiosity is very widespread. This implies that different standards of books will have to be matched with each child in each of several subjects. Thus reference service to a child is much more exacting than to an adult. And yet, the Second Law insists on every child being found his exact book. The Third Law too insists on each children's book being found its most suitable child-reader. Again, the capacity of a child to maintain his attention on the same topic for an appreciable length of time is very small. Attention and interest are as fleeting as the field of curiosity is wide. Parents usually take advantage of this to divert the attention of a child and thus evade its importunities successfully. On the other hand, the librarian should exploit the child's interest within its short duration and feed it with the right books. The expeditious trial and error method to achieve this requires that the child should have direct access to the shelves. Time will be otherwise lost, much against the wish of the Fourth Law. And the opportunity to serve the child, too, will be lost along with it. Thus, according to the Second, Third, and Fourth Laws alike, open access is even more necessary for a child than for an adult.

332 Educational Value

About sixty years ago, a new trail was blazed in educational theory and practice by the School and society (1896) of John Dewey. It has now developed into various systems of individual pedagogy, such as Contract Technique, Dalton Plan, and Project Method. In all such systems, the library is regarded as a workshop. Just as one has access to the crib of tools in a workshop, the child is admitted into the library and given freedom to browse among books and choose. In his picture of the school, Dewey made the library the heart of the school. It is the open clearance house for all the intellectual urges of the child. He enters it to satisfy with the aid of the book collection, the curiosity roused elsewhere, be it the home, the class room, or the playing field. Incidentally, while browsing amidst the books and dipping into this book and that, the child's curiosity is roused to verify or experience something in actual life. Thus open access is closely interwoven with modern educational technique

333 Value for Library Civics

A library has to be shared in common by all the members of its community. This implies at once a right and a duty. This demands conformity to certain common rules of library civics, even as life in society has to conform to common law and civics. In particular, open access demands a particularly severe standard in library civics. Many selfish and anti-social propensities, inherited by the human race from its jungle stage and its pre-forms, have to be shed by the readers. The earlier one begins to practise common ownership and to shed such propensities, the more helpful it will be. A sense for the equitable sharing of public property and of civic responsibility can be inducted best in childhood. It is then also likely to stick on all through life. Thus to make open access safe in libraries for adults, it is wise to begin open access in libraries to children.

4 OBJECTIONS TO OPEN ACCESS

Open access is a new practice in the library world. It had its beginning only within living memory. Its novelty induces objections in conservative minds. The practice of preserving books against every conceivable risk originated as early as any library was established. This age-long practice carries greater weight with conservative minds than the practices required for the discharge of the other eight recent functions of a library system. The call of democracy to make for wide use of books is not heard by them. The reduction of the cost of books and the production of many copies of a book brought about by the technology of printing and other methods of photo-reproduction are not taken into consideration by them. The distribution of the several library functions between the dormitory and the service libraries of a national library system is lost sight of by them. The conservative minds still continue to look upon every scrap of printed paper coming into the library as costly property that should not be exposed to any risk whatever. In fact all the objections raised against open access arise out of giving wrong weightage or overweightage to some risk or other. We shall first examine these. We shall next view the problem from the angle of certain analogies.

41 Mutilation of Books

The least thoughtful objection is that of the risk of mutilation of books. A little reflection will show its poor validity. An unscrupulous reader mutilates a book only when he is with it in seclusion. He gets opportunity for this in plenty when he sits with the book in a sparsely occupied part of the reading room. His opportunity is even more plentiful when he takes the book home on loan. A clever mutilator will not cut out too many leaves at a time to admit of easy detection. Neither this, nor underlining, nor disfigurement of margin or illustration can be detected at the discharge-counter of a busy library. The extra opportunity for mutilation given by safe-guarded open access is negligibly small. Mutilation can not be advanced as an argument against open access.

42 Casual Misplacement

A valid objection to open access is the risk of casual and unintended misplacement of books by readers. One safe-guard invariably taken to minimise this risk is that a reader is not allowed to take a book to the stack-room. This safeguard eliminates the risk of major displacement. Of course, this does not provide against casual displacement during browsing. But, in this the misplacement will be only slight. A book is likely to be shifted from its right place only by a few places. These are generally set right by the reference librarian while helping a reader. It is also rectified as a pick-up work to fill up vacant intervals when no reader turns up. This is casual shelf-rectification. It involves no cost. Apart from this, rectification can also be done as a daily routine without extra cost, by coupling it with stock-verification. A detailed description of this routine is given in chapter 8 of Library administration (1935) and of Library manual (1951) of Ranganathan. In this prescription, the same process results in stock-verification and shelf-rectification. Stock-verification is staggered over the whole year, at so many hours per day. A daily quota is fixed for verification. As the shelf-register cards and the books are tallied, all misplacements are automatically detected and set right. The rhythm of the library work is not disturbed. Readers are never denied the use of the books in order to verify stock.

43 Deliberate Misplacement

A more serious risk is the deliberate misplacement of a book far, far away from its right place, by a selfish unscrupulous reader. He does so to prevent others from having access to the book. Such deliberate misplacements are however few and far between. In the experience of the Madras University Library during 20 years, not more than a score of such deliberate misplacements took place in a year. The daily quota of stock-verification cum shelf-rectification detects them within a month or two. It is text-books and other books in great demand that are so hidden. In these cases, readers register for them, if they are not found in the shelf. If a registered book is not found charged at the counter or in use in the reading room, it is a signal that it is hidden in a wrong place. A vigourous search usually locates it. Such a book is left in that wrong place and entered in the black list. When it is brought to the reading room or is presented at the counter to be charged for home-reading, the miscreant is caught Every care is thereafter taken to have an eye on him when he is in the stack-room. Sometimes, it is also possible to wean him from such anti-social acts, by appealing to his good sense. It is always possible to keep track of books so hidden in the library. Thus, the risk of misplacement - casual or deliberate - can not be cited against open access.

44 Theft

A risk that is greater in an open access library than in one without it is deliberate stealing. The safe-guards in open access enumerated in section 25 minimise the consequences of this risk. In the first place, we put under lock and key and keep out of open access, all the rare, costly, and irreplaceable books, pamphlets and miniature books that can be easily smuggled, and books of permanent value but not getting re-published. It requires a clever thief to escape all the vigilance in the stack-room and at the counter and smuggle a book away. But every community has a few such clever thieves. They invent ingenious methods of smuggling. In the colder climates, the heavy clothing lend itself easily for the purpose. But even in the tropics, where people wear only a thin shirt and dhoti (a piece of cotton cloth wound round the lower parts), the clothes have been used for smuggling books. One of the methods used has been to peel off the stiff card-board binding quickly in any split second when the eyes of the staff and other readers happen to be away, and tie up the supple leaves underneath the dhoti, close to the belly. The discarded card-board covers tell the tale too late, to discover the culprit. This theft cannot be detected or eliminated except with a specialist in detection work. During a period of 20 years, such theft had taken a toll of about 50 volumes a year in the Madras University Library. It works out to about one volume for a thousand volumes used by readers. In my Library development plan for the Allahabad University (1947), which was reproduced in 1952 in the Justice Mootham's Report on the reform of that university, I had recommended open access with the warning that the university should be prepared to write off about one volume for every thousand used by readers and that they should not perpetrate the Victorian method of penalising the librarian for that risk. The Authorities printed the report and a copy appears to have been sent to Berwick Sayers. He wrote to me that the margin of tolerance suggested by me conformed to the experience of his library. On checking up the records for about fifty years, he wrote to me, he found that the tolerance suggested in my development plan was of the same order as the loss experineced in that library. He further added that during the earlier part of the period the library did not have open access and that the loss during that period was only half as much as in the open access period. After all, there are thieves who will manage to steel even in spite of the best of security arrangements. The extra risk caused by open access does not appear to be considerable in quantity. And as already stated, it is rendered inconsiderable in quality and value, by the measures of safeguard - especially that of locking up abnormal documents of every kind.

45 Social Equity

It is against equity to prevent books from fulfilling their social purpose or to stand in the way of society getting a full return on the money sunk in books, or to penalise the majority of the public who are honest, because of our inability to keep track of a handful of criminals abusing open access. The equitable course is to take steps to detect and prevent crime and to give all possible facilities for the honest folk. This is what is being done in other spheres of life. Library can not be made an exception to this practice. After all, the library alone cannot be expected to escape the risk to which society at large is exposed on account of its inability to eradicate crime.

46 Analogy of the Business World

Library authorities should look at the business world for a helpful analogy in this matter of open access. Large shops such as Migro's in Zurich, Macy's in New York, and Selfridge's in London show the way. They demostrate the vision of practising open access and taking the risk associated with it, in order to increase the volume of business. They expose a variety of even small wares and allow customers to handle them freely. This is open access to their goods for sale. Book shops too give open access to the books in their vast show rooms. Thirty years ago, when I was studying the art of library service in Great Britain, I asked the owners of some of these business houses about the risk of such a step. They said that they were prepared to write off a certain percentage on that account and that it was a price worth paying for the better turn-over that resulted. In the approach to a suburban railway station in Massachussetts, I saw a heap of copies of daily newspapers left on the road-curb. People were picking up copies and dropping coins in a small cup placed by the side of the heap. On enquiry, it was learnt that the risk of this "open access" was worth taking. It appears that the cost of the copies taken away by unscrupulous people without putting the coin was less than the wages to be spent on a vendor. The buses in some of the towns in U.S.A. do not have conductors to issue tickets. Each passenger is expected to put the coins in a receptacle at the entrance. This is near the driver's seat. I did not know about this 'open access' system in buses. I took my seat without putting the coin. The driver was too busy at the wheel to see this. Some minutes later, I asked a passenger, "When will the conductor come to collect the fare"? His reply made me wise in the matter. Later, I learnt that the Transport Authority had found that the loss due to non-payment by unscrupulous and forgetful passengers was much less than the salary of a conductor. Yes; even as a business proposition, open access is a sound and profitable practice.

47 Wear and Tear

Another argument raised against open access is increase in wear and tear of books. It is true that books will be used more in an open access library than in one without it. Apart from increased use in study, browsing will bring its own quota of handling. All this will certainly increase wear and tear. But to complain against wear and tear of books caused by legitimate use by readers is like a priest complaining of the pavement and furniture in the church being worn out by the incessant crowd of devotees coming to pray. According to the Laws of Library Science, it is the ever-fresh, untouched-by-hand book that is a curse rather than the book that is ever in circulation, ever touched by human hand, and thereby reduced to pulp.

471 Frailty of Book

After all, a book is a frail entity, when viewed as a material. Hardly any book of normal build is strong enough to be read more than 500 times. In other words, it is bound to perish after being handled by readers for about 6,000 hours. Here is a personal experience. On 14 November 1923, my headmaster P A Subrahmania Ayyar presented me with a copy of the Ramayana of Valmiki. Since that day, I have been reading every day a chapter from that copy. On an average, the copy has been handled for about half an hour each day during the last 32 years. This means handling and use for about 6,000 hours. Nobody else has handled it. The copy had to be rebound once. It has now again got tattered. Many leaves are coming off. Normal re-stitching is no longer possible. The paper has lost its colour. It has become brittle. We can not expect a library copy of a book to be an eternal entity. But, it would prefer perishing in the hands of readers to being eaten away by insects or being brought to its end by sheer efflux of time.

472 Pedestrian Book

It needs no regret that the library copy of a pedestrian book gets worn out by use in a period of, say, 5 to 10 years. Beyond that period, its thought-content will be out-moded. It may not have any value other than antiquarian, unless it gets revised and brought up-to-date in a new edition. If the library copy gets circulated at least 500 times within this period and perished physically before it perishes in its thought-content, the library has got the maximum return for the society on the money spent on it. This is about the copy in a service library. The copy in the dormitary collection of the country of the region is made to live as long as possible for the benefit of antiquarian and bibliographical use.

473 Classic

A classic is immortal as a work; but its physical embodiment as a book is mortal, like any other book. This corresponds to soul being immortal, but body being mortal. The library copy of a particular edition of a classic can not have a longer expectation of life than a pedestrian book. It too should submit itself to the same wear and tear as a pedestrian book. We need not be sorry for this, as a classic will continue to be brought out in new editions from time to time and for ever.

48 Analogy of the Industrial World

In one sense, a service library is like an industrial plant. The latter transforms raw material unfit for consumption in its native state, into a commodity fit for consumption. One has also to transform one form of energy into another more serviceable form. Engineering is the art of such transformations. In engineering, we willingly reconcile ourselves to the unavoidable waste of some part of the materials. We deliberately provide for the deterioration and the ultimate writing off of tools and machinery. Even otherwise, we scrap them because of obsolescence. We also reconcile ourselves to the dissipation of a large fraction of the energy derived from the sources of power. Let us call this "technological-engineering". In library service, we practise thought-engineering; we transform thought, stored in books in a latent state, into activated thought bombarding the human mind and thereby leading to the creation of new thought. Also, in this engineering - transformation - we must be prepared to write off worn-out books; we should not clutter the shelves with obsolescent ones; we should reconcile ourselves to some dissipation. If thought-engineering does not succeed in libraries in spite of the wear and tear and some unavoidable loss due to open access, used to stimulate increased use of books, technological-engineering cannot make sufficient progress in industrial plants and service organisations. In technological-engineering, we know that perpetual motion is impossible; the difference in the entropy avialable goes on decreasing; this is the finding of the science of thermo-dyanmics. Perpetual existence of a copy of any book is similarly impossible in thought-engineering; a book must perish by use; this is the finding of library science. This does not mean, let it be repeated, that a work will perish; so long as it has value, it will keep coming out in the form of a new book.

5 ARRANGEMENT OF BOOKS IN OPEN ACCESS

Open access has brought about a revolution in the arrangement of books in the shelves of a service library. In the pre-open-access days, the common practice was to number each place in the shelves, put the books in the shelves in the sequence in which they are added to the library, and put on each book the number of the place occupied by it. In fact, the number so put on a book was called its 'press mark'. This may be called "Absolute Placing". Such absolute placing is still appropriate in the dormitory collection of a national or regional library. But a service-library should arrange on a subject basis; experience shows this; the laws of Library Science imply this.

51 Classified Arrangement

Arrangement on subject basis requires a prior classification of each book. The more minute the classification, the more helpful it will be in an open access service libaray. How minute? No two topics should bear the same class number. Each topic should have its own distinctive class number. Except in the case of general text-books and comprehensive treatises covering a broad area of knowledge, such as a main or a canonical class, there will not be more than a dozen books with the same class number. This gives a rough indication of the minuteness of classification to be aimed at.

The dozen books within a class should be further individualised by their respective book numbers, based on non-subject characteristics, such as language, form of exposition, and year of publication, and/or name of author as the case may be.

52 Effect on Library Catalogue

It will be a help if the classified arrangement of books on the shelves is parallelled by the library catalogue having a classified part. In this, the entries will have to be arranged by the class numbers of the books or parts of books described by them. There should also be the usual alphabetical part of author and series entries, and entries of fanciful and oblique titles. Each entry relating to a specific book should give the call number of the book so that the reader can locate the book in the stack room. In addition, the alphabetical part should also contain class index entries. A class index entry will begin with the name of a class - a topic - and direct the reader to look up the classified part of the catalogue or the shelves themselves, in the region covered by the class number given by it at its end. A reader will bring to the catalogue, only the name of his subject in the natural language. These calss index entries should give the translation of that name into the name in the artificial language of ordinal numbers, which the class numbers, in effect, constitute.

6 STACK-ROOM MAINTENANCE AND OPEN ACCESS

61 Guides

An open access library with classified arrangement will be unusable, unless its stack-room is profusely guided. I have seen the pathetic and frustrated state of readers in a classified, open access library left without proper guides and without reference help. All the laws of Library Science were flouted by the indolence of the staff disabling them from providing the necessary guides. Each tier or room, as the case may be, should have a tier or room guide. It should indicate clearly the main classes housed in it. Similarly, each gangway in a tier or room, should have a gangway guide. It should show the range of classes housed in the line of book-racks covered by it. Each bay in each line of book-racks should have a bay guide. The optimum number of shelf-planks in a bay is six. The bay guide may have to have as many as six lines so that the subject-contents of the bay may be fully revealed. As the reader walks down the gangway, it is the bay guide that gives the greatest help. That is why the bay guide should be as full as possible. Lastly, each shelf-plank should have its own guides along its front edge. The usual standard length of a shelf-plank is three feet. In some cases, as many as six shelf guides may be necessary to mark off the successive classes accommodated on it.

62 Legend on the Guides

The legend on the guides is to be determined by the help it should give the reader. There are two kinds of help to be given by them. A reader might have picked up from the catalogue, either the call number of a book, or the class number of the subject in which he desires to have books. In either case, it is for the class number that he will first look for. This is an ordinal number, already stated. The guides should therefore contain the class numbers. Naturally, the class numbers on tier guides and gangway guides will be short. These numbers will guide the reader to the bay and the shelf-plank containing his class number. Alternatively, a reader may guide himself solely by the guides, without looking up the catalogue at all. Most readers will begin to do so sooner or later. To help such a reader, the guides should contain the names of the classes in the natural language in use in the library. The presumption is that the scheme of classification arranges the classes in a sequence which the reader more or less expects, or at least which he finds to be a more or less helpful or filiatory one. Thus the legend in each guide will be a bilingual representation of the name of the class concerned - in the natural language of the library as well as in the artificial language of class numbers.

63 Mobility of the Guides

Books in a growing service library will be added to and withdrawn from the shelves from time to time. This will be unequally incident on the different shelf-planks, bays, and even the rows of book-racks in the various gang ways. Therefore, the positions of the classes will vary from time to time. Consequently, the guides will have to be changed from time to time. For a guide telling the wrong tale is even worse than no guide. The mobility demanded will be the greatest in the case of the guides of the shelf-planks. They are also most numerous. Their number may be as much as eight per cent of the number of books in the library. To change their position easily, it is best to have a groove in the front edge of the planks, along which the guides, usually thin bristol board strips about 5 inches by 3/4 of an inch, could be slided. Moreover, to facilitate the transfer of a strip from one plank to another, without having to empty the plank or to move it out of position, it is convenient to make the plank project outisde the uprights supporting it by the slight distance equal to the depth of the groove. To secure mobility for the bay guides, each guide should consist of a stiff card board or other material on which the legend could be stencilled. The receptacle for the board should be a grooved frame, into which it can be slid with ease. These frames should stand suspended in front of the tops of the bays, from a rod running close to the ceiling along each line of book-rack. These rods can also carry the gangway guides. The frames should be suspended by simple hooks, so that they can be easily shifted from one position to another. The rods for the guide frames should be built in from the ceiling or from the side walls even when the stack-room is built. Failure to do this has often led to difficulties in the maintenance of the guide system. All these physical aids to secure mobility of the guides are essential in a growing, open-access, service library.

64 Length of Shelving Space

Classified arrangement gives relative location and not absolute location as with press marks. In the latter, books can be packed in the shelves quite compactly, adding each new book only at the very end of the existing collection. This is not possible in relative location as determined by the subject of the books. Each book will have to be added only at the point where the other books in its class are standing. Compact shelving is therefore not possible. A reasonable amount of shelf space will have to be left at the end of the collection in each class. Experience shows that in a normal service library, about a third more of shelving space is necessary than in compact arrangement in accession sequence.

65 Space between Planks

Again in a non-open-access dormitory collection with the books arranged in accession sequence it is possible to sort out books into about six or more groups on the basis of height and to shelve in a compact way the books in each height-group. This will eliminate wastage of space between shelf-planks. But this will scatter the books in a class too unhelpfully for an open-access service library. All but the giant folios and pigmy books will have to be shelved in a single sequence. This will naturally result in waste of space between two consecutive planks, since this will have to be determined by the tallest book standing on the lower of the two planks. Experinece shows that in a normal service library, about a sixth more bay space is necessary than in compact arrangement in different height-sequences. Taking this along with the finding in section 64, about fifty per cent more of book-rack length is needed to have open access, instead of a closed system.

66 Stack-room Area

The above-mentioned considerations would increase the stack-room area by 50 per cent. There is another factor calling for its further increase. In a dormitory collection, only a staff member will go into the gangways between the lines of book-racks. It will, therefore, be sufficient to have a gangway of 2½ or 3 feet in width. But in an open access service library, a large crowd of readers will move up and down each gangway at one time or other - in the peak hours. Therefore, it is necessary to make the gangway 4½ to 6 feet wide. This would again increase the stack-room area by 50 per cent. Thus, on the whole, the stack-room area of an open access service library will have to be double that of a closed dormitory collection. The practice of putting the book-racks all along the walls or in the alcove fashion in the reading room cannot be had in an open access library, since the large number of readers browsing among the shelves will disturb the readers settled down to study. Therefore, a separate stack-room is a necessity.

67 Height of Book-Rack and Tier-Arrangement

In a dormitory collection, the height of the stack-room can be the usual building height of about 12 feet. And the book-rack can reach up to the ceiling. For it is only a staff member that will have to reach for the books in the higher shelf-planks. He can be made to climb a ladder. But, in an open access service library, no book-rack should be more than $6\frac{1}{2}$ feet in height. For any reader should be able to reach for any book on any shelf plank, while standing on the floor. To avoid waste of vertical space, it is the practice to build the stack-room in tiers of about 8 feet of height. Even in a small single-room library building, it is economical to reserve one part of the room for reading room etc and to provide two tiers at the other part to serve as a stack-room.

68 Compact Stack-Room

In a service library with a small number of readers only - such as the library of an industrial research institute or a government department, which are usually situated in crowded cities where space is dear - it is possible to have a compact stack-room even for open access. I saw one such arrangement recently in the Steel Research Institute of Dusseldorf in Germany. The lines of book-racks are all carried on strips which can be made to lock up on a steel bar. The lines of racks move parallel to themselves. The lines of racks are all closely packed, except that just one and one pair of consecutive rows of racks can be pulled apart at any one time, by an electrical device so as to have about 3 feet of gangway between them. A reader can create the gangway at any point of the stack-room he likes and have access to the books in it. Of course one and only one gangway can be created at a time in the entire stack-room. That is why this compact arrangement will be suitable only in a research library with a limited number of specialist readers. This compact arrangement will make a saving of 70 per cent in the stack-room space for a collection of about 50,000 books. Its length can be reduced from 120 feet to 33 feet.

7 HUMANISM AND OPEN ACCESS

A library authority should orient itself properly to all the implications of open access, its social benefits, the necessary safe-guards, and the residual risk. The inhuman practice of compelling the librarian - getting in most libraries not more than a bare subsistence allowance - to pay the cost of the books lost or mutilitated, should be given up. While a librarian of proved criminal trend or negligence should be fired or pulled up as in the case of any other employee, the library authorities should write off losses within the limits of tolerence - as stated already, about one book for every thousand volumes issued for use - and should abstain from subjecting the librarian to humiliation and harassment. Open access with a play of humanism from the side of the management is a blessing to the reader and the librarian.

71 Human Value to Reader

Apart from the over-all cultural, political, economic, civic, and educational value, open access conserves and enhances the self-respect, self-dignity, and self-help of the reader. The self-confidence flowing from this will have an invaluable human influence, and chasten and stabilise many millions of people. To secure this human value of open access, librarianship should develop the organisation to the point at which it can leave readers as much to themselves as possible, while remaining in the background, as it were unseen, yet always there when asked for. Librarianship is raised to a higher order of power with each advance towards the self-responsibility of readers. Open access is a step in this direction.

72 Human Value to Librarian

The benefit of the humanism of open access falling to the share of the librarian is equally great. Though I had always been the chief of libraries, I have done every kind of library work from dusting books to framing library policy. But the moments in my professional life, when I have had the greatest joy and satisfaction, are those spent on floor duty in open access service library. To watch hundreds of readers browse among books, to give them such reference help as they need or ask for, to step back a pace leaving them to do for themselves as much as they can, to throw a hint unobtrusively at moments of their hesitation or doubt, and to enjoy the sight of joy blossoming on their faces when the right book is finally picked up - this is the most valued prize coveted by a librarian. This can be had only in an open access library.

CITATION OF PERIODICALS

A. NEELAMEGHAN

Hindusthan Antibiotics, Pimpri

Shows the purpose of using abbreviated titles of periodicals in citation. Indicates the lack of uniformity in abbreviation among international lists. Enumerates some principles for ensuring uniformity. Recommends the use of co-extensive class numbers for citation and identification of periodicals.

The main purpose and idea behind the use of abbreviated forms; instead of the full titles, in the citations of and references to, periodicals, are that space, and hence time, could be saved in writing, printing, etc., and that the periodicals in question could be correctly identified from the abbreviated titles.

In the eighteenth century and earlier abbreviated forms were used even to cite book titles. Nobody could then possibly have foreseen the present day proliferation of periodicals particularly in the sciences. The practice of using abbreviated titles, once convenient for a much smaller number of periodicals, has given us quite a few problems to solve when applied to the greatly increased number of periodicals. Complications arise because of titles almost similar in form in the same as well as different languages and countries, the publications of corporate bodies and the transposition of words, the inconsistent use of capitals and small letters in the abbreviated forms, etc. Opinions differ as to the principles to be followed in the compilation of standard international lists of abbreviated forms or titles of periodicals. Hence we have more than one such international list.

Besides the differences in international lists, to bring into common use any one set of abbreviations is further complicated because, it is often the scientist who quotes, refers to and copies down titles of periodicals and ordinarily he is not fully aware of the complexities involved in bibliographic citations, add to this the various editorial practices and stipulations of journal reference methods of different periodicals. So then our scientist uses any type of abbreviation which comes easily to him 'at the moment', most often without any thought as to the future use of the same form or as to standard forms in international lists. On the other hand, the librarian and the bibliographer have to identify the journals referred to by these varying abbreviated forms, and hence their anxiety for uniformity of citation methods. Then there is what may be termed 'national usage and familiarity'. To an Indian doctor the abbreviation J.I.M.A. would be quite familiar, in the U.S.A. any medical man will recognize J.A.M.A. or even J.A.C.S., while among Japanese medical men the abbreviation J.J.P.S. may be quite common usage. But outside their respective countries these abbreviations would be difficult for easy identification. There is yet another factor which, though not quite obvious, has a bearing on the question. A name or abbreviation becomes fixed in our mind and comes into common usage if we always employ the same form of the name in speech, writing, etc. We always say 'Journal-of-Clinical-Endocrinology' and not 'J-Clin-Endoc'; we say 'Indian-Journal-of-Pharmacy' and not 'Ind-J-Phar' and so on. Therefore the proper forms of the abbreviations rarely become impressed in the minds of readers.

The conditions or factors which could ensure uniformity in quoting periodicals are:

1 There should be only one form in which periodicals are to be quoted or referred to either in common speech or bibliographic citations.

2 There should be no alternative appelations irrespective of the country of origin or language of the periodicals.

3 The single 'name' of identification should come right from the source of production of the journal, i. e. from the publishers and not given to it or made out by users of the periodicals or bibliographers or librarians.

The present system had come up because the periodicals have been 'named' the way they are done now. Supposing the American Medical Association had christened their periodicals as AMAI, AMA2, AMA3, etc., Messrs Williams & Wilkins their periodicals as WW1, WW2 and so on (following the practice of naming some drugs), we would have referred to those periodicals, as AMA1, AMA2, etc. So it largely depends on the way periodicals are named by the publishers.

Different ways of citing periodicals have been suggested. McCasland[2], Reid[3], and Bishop[4] suggested letter abbreviations, while Garfield[5] pointed out that serial numbers such as those in the World List of Scientific Periodicals could be used to identify periodicals. It would indeed solve many problems if the publishers of periodicals would 'name' their periodicals by these numbers (and forget all about vernacular titles) so that in future the periodicals would be known and referred to by these numbers. There would however, be difficulties with periodicals not in the World List and periodicals to be published.

McCasland hinted in his alphabetic code that the first letter in the code could represent the country of publication, and the second letter a mnemonic for the subject field covered by the periodical. These alphabetic abbreviations depend on the existing titles of periodicals and so suffer from some of the difficulties now arising out of the use of conventional abbreviated forms for the titles or periodicals.

The classified approach in the naming of periodicals is examined below. The display of current issues and the filing of back volumes of periodicals in classified order is nothing new. The Japanese bibliography of medical sciences gives a classified list of Japanese medical periodicals according to U. D. C. A good example of a classified list of thousands of scientific periodicals is the Union Catalogue of Learned Periodicals Publications in South Asia, v. 1 Physical and Biological Sciences (by S. R. Ranganathan and others, Indian Library Association, 1953). The classification used is the Colon scheme. For each periodical the class number gives

The major subject covered by the periodical
The country of publication
The year of issue of the first number

In addition the class number would indicate whether the publication is an ordinary journal, a report, yearbook, etc.

Examples:

Journal, Society of Telegraph Engineers Society of Telegraph Engineers, Journal	D66m56, M72
West African Medical Journal	Lm654, N27
Geophysical Memoirs	H4m56, N11
Bulletin, Calcutta Statistical Association Calcutta Statistical Association, Bulletin	B28m44, N47

It would be possible to shorten the class numbers for existing periodicals, say by giving the number for a wider geographical area instead of for the specific country, so long as there is no conflict between any two class numbers.

Supposing scientific periodicals hereafter take these class numbers instead of their present titles, in due course the periodicals will be known and referred to by these class numbers.

The advantages of 'naming' periodicals by class numbers are:

When periodicals are displayed or back sets filed by the numbers (which are also the 'names' of the periodicals) there will result a grouping of periodicals by subjects the advantages of which are obvious.

All associated periodicals on the same subject, issued by the same learned body could be conveniently brought together.

Until the subjects covered by a periodical totally change, the class number need not change (i.e. the 'name' of the periodical would remain the same).

The present difficulties viz transposition of words in the title in the filing of and citations to periodical publications of corporate bodies would not arise.

In the making of future union catalogues of periodicals, which would automatically be of the classified type, there would be considerable saving in the alphabetical part wherein there would be need for only indication of publications of corporate bodies and a subject index to the classification scheme.

Difficulties with classified arrangements of periodicals arise from our having both the alphabetic titles as well as classified arrangements. What is proposed in the present paper is a radical change: Publishers should avoid the alphabetic or vernacular titles and use only the symbolic class numbers instead. The scope of the periodical and other details could be indicated in the subtitle, imprint, etc. The periodical will come to be known by these class numbers and by constant use readers would soon learn what symbols represent that subjects and other classification details, if they are interested.

I have mentioned only about the Colon scheme for the classification of the journals, because, as already indicated, for each journal the class number gives useful bibliographic data and each facet can be sharpened for individualization and exact definition, and we already have an extensive union catalogue in which periodicals are arranged by these class numbers.

REFERENCES

1. ARTELT, W. Bull. Med. Lib. Assn. 43:52 (Jan. 1955)
2. McCASLAND, G.E. Science 120:150 (23 July 1954)
3. REID, J.B. Amer. Doc. 5:26 (Jan. 1954)
4. BISHOP, C.B. Amer. Doc. 4:54 (Apl. 1953); 5:28(Jan. 1954).
5. GARFIELD, E. Science 120:1039 (17 Dec. 1954); 122:108(15 July 1955)
6. JAPAN. Science Council & Ministry of Education. Japan science review: Medical sciences. v.1. Bibliography 1953. Tokyo, Gihodo, 1954.